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OF
SALMON REPRODUCTION IN THE NORTHERN BALTIC AREA AND ITS CAUSES

BY

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Foreword.

THE present report is a continuation of, and supplement to, a paper by the author entitled "Fluctuations in the Baltic Stock of Salmon (1921—1935)" published in 1938 by the International Council in the Series "Rapp. et Proc.-Verb." No. 106. This investigation differs considerably from the first because the conditions of salmon fishing in Finland, where the material has been collected, have greatly changed during recent years, and the author has used another, and more general, approach. The aim of the author, however, has been to make the tabular material in the two papers as comparable as possible.

The growth of industry since Finland became independent has given special significance to the use of water power. This fact has already had considerable influence on the possibilities for the reproduction of salmon as well as on salmon fishing itself. The two great salmon rivers of southern Finland have to a great extent—in fact almost completely—lost their original natural conditions and simultaneously their importance as salmon rivers. Dams now block the ascent of salmon and consequently have done away with feeding areas for parr. Several fishing stations where my material was formerly collected have had to cease operations. This occurred in the western arm of the Kymi River, at Ahvenkoski Rapids in 1931 and in its eastern arm, at Langinkoski Rapids and Ränninkoski Rapids in 1938. Fishing was resumed in the eastern arm in the summer of 1942 but with poor results. Therefore investigations at the mouth of the Kymi River have not been continued. This is also the case in the Kokemäki River. The construction of a power station at the Pirilä Rapids in Harjavalta in 1940 has stopped the ascent of salmon to the upper parts of the Kokemäki River; it has also ruined the extensive breeding and feeding area above the dam where other migratory fishes as well as salmon used to breed and feed. At the mouth of the river, for instance at the Lukkarinsanta netting grounds immediately above the town of Pori, fishing is still practised, although restricted by certain other obstacles. This collecting station also has not been used since 1941.

Not only in the salmon rivers of southern Finland have the power stations had a destructive effect on the stock of salmon. At the Oulu River in northern Finland plans for utilizing water power have already been completed; the construction of power stations in two other places is also well under way. The dam in the Merikoski Rapids near the town of Oulu hindered salmon fishing to such an extent that fishing in Pyhäkoski Rapids — which had provided me with material for investigation since the year 1925 — had to be transferred to the Merikoski Rapids below the dam. I have obtained my specimens from this latter place in 1941—1944.

This year (1945) the State Council of Ministry when considering plans for the reconstruction of the railway bridges destroyed by the retreating German troops agreed that the Kemi River should also be dammed close to the sea. Proposals to mitigate the damage to the salmon fisheries have not as yet been made public.

Under the conditions described above the Kiviranta weir at the mouth of the Tornio River has become the most important and representative of my earlier collecting stations; thanks especially to Miss HULDA PELTTARI and the local fishermen I have been able to obtain measurements and scale samples of every salmon caught from the year 1931 onwards. The Sumisaari Weir, where the same details were formerly collected, has not been built for fishing since the year 1936 because of the small number of fish caught. Collections have been made every year at the Köngäs Weir (in Tervola) and at the Muurola Weir (in Rovaniemi) which are situated in the Kemi River, though the catches have been relatively small. Limited collections of scales and measurements were also made until the year 1940 in the Valkeakari fishing grounds in the sea, and in 1943 in the Pensaskari fishing grounds farther out to sea, off the mouth of the Kemi River.

To supplement these collections, I have endeavoured

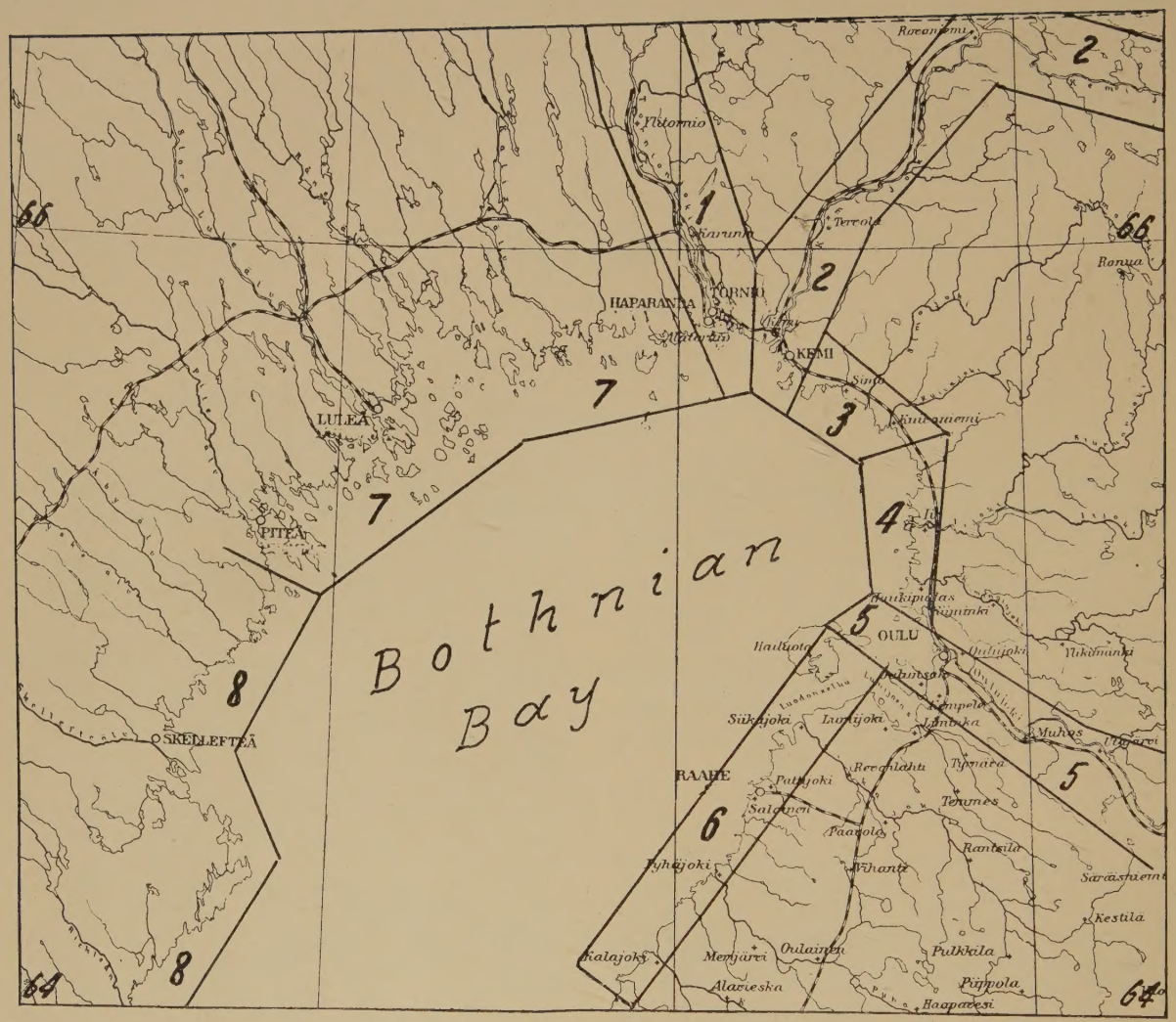

Fig. 1. Northern Region of Bothnian Bay, Salmon Areas:—
1. Tornio, 2. Kemi, 3. Simo and Kuivaniemi, 4. Ii-Haukipudas, 5. Oulu, 6. Raahe.
On the Swedish side: 7. Norrbotten, 8. Västerbotten.

to arrange for new collecting stations, particularly on the sea-coast. But difficulties have arisen because the fishermen are overworked during the short but intensive fishing season, in June and July. Consequently I have been able to obtain only small collections off the mouth of the Ii River in the years 1942 and 1944 and at Simoniemi in the year 1943.

The following persons have collected scales and made measurements during the years 1936—1944: Hulda Pelttari at the Kiviranta Weir in the Tornio River, Matti Rantapörhölä († in 1939), Eemeli Rantapörhölä and Pauli Ailinpieti at the Valkeakari fishing grounds, Olli Kilpelä at the Köngäs Weir and V. Alaruikka at the Muurola Weir in Kemi River, Jaakko Kaiponen at the Pyhäkoski netting grounds, Jaakko Kurtti and Heikki Tikkanen at the Maijala and Merikoski netting grounds in the Oulu River, Hannes Kauppila outside the mouth of the Ii River, J. E. Miettunen at Simoniemi. J. Leikas has supervised the work at the Langinkoski and Ränninkoski Rapids in the Kymi River and Eero Perho at Lukkarinsanta in the Kokemäki River.

From the Central Meteorological Institute (the director of which is Professor J. Keränen) and from the Hydrographical Bureau (the director of which is Dr. Henrik Renqvist) I have obtained the information required regarding the Bothnian Bay region. Mr. O. Sjöblom and Mr. A. Lungwitz have drawn the water-level graphs in the appendix for three

stations on the Tornio, Kemi and Oulu Rivers, and Dr. Frans Lönnfors has recorded the maximum and minimum observations.

Miss Toini Muroma, who has been my assistant for many years at the Bureau for Fishery Investigations, has drawn up the tables under my direction with care and precision. Mrs. Edith Hasa, and later Miss Muroma, have assisted me with the statistics of the catches. I have performed the work on the determination of the life-cycle classes and age-classes. Without the zealous work of my collectors the material for this investigation could not have been obtained. I also wish to express my gratitude to all my assistants for their share in the work. I should further like to express my gratitude to my colleague Mr. W. J. M. Menzies for his kindness in correcting the English of my manuscript.

In order fully to understand this report the reader must have a knowledge of the international nomenclature used in connection with the life-cycle classes. In the formulae used the first designation refers to the smolt age, the second to the migratory years in the sea prior to the return to fresh water, the + mark to the growth during the year of observation, and the G mark to the spawning operations after the fish has returned from the sea.

The following table shows the grouping of individuals belonging to a certain year-class into age- and life-cycle classes. The few fish which have previously spawned have life histories which vary considerably. Often there is not a single individual of a particular year-class in one or more of the older life-cycle classes. The possibilities of variation are especially great among the oldest age-classes and particularly among those which are over ten years of age. Among the individuals belonging to the ten-year-old age-class, which have ascended and spawned, twenty-two different variations are possible. However, very few individuals of this age, or of a greater age exist. The chances of catching them are correspondingly small.

There is often reason to treat the salmon which have lived for an equal length of time in the sea as a special group, whatever their smolt ages may have been. To represent these migratory groups I have used the designations: A.1+, A.2+, A.3 etc.; the letter A denotes all the different smolt ages.

When referring to my report published in 1938 I have used the abbreviation: l. c.

Finally I wish to call attention to the fact that, although the material of my investigation has been obtained from the Bothnian Bay region, it really represents the Baltic stock of salmon as a whole, since this stock is to a considerable extent uniform because of its mobility.

The Division of the Year-Class 1930/31 into its Different Phases up to the Age of Ten Years.

Years	Age (Years)	Life-Cycle-Classes before spawning	Life-Cycle-Classes after the first spawning
1931	0	+	—
1932	1	1+	—
1933	2	2+	—
1934	3	3+, 2.1+	—
1935	4	4+, 3.1+, 2.2+	2.1+G+
1936	5	5+, 4.1+,	2.1+G1, 2.2+G+
		3.2+, 2.3	3.1+G+
1937	6	5.1+, 4.2+,	2.1+G2, 2.1+G1G+,
			2.2+G1, 2.3G+
		3.3, 2.4	3.1+G1, 3.2+G+
			4.1+G+
1938	7	5.2+, 4.3	2.1+G3, 2.1+G2G+,
			2.1+G1G1, 2.2+G1G+,
			2.3G1, 2.4G+
		3.4, 2.5	3.1+G2, 3.2+G1, 3.3G+
			4.1+G1, 4.2+G+
			5.1+G+
1939	8	5.3, 4.4, 3.5	2.1+G3G+, 2.1+G2G1,
			2.1+G1G1G+, 2.2+G1G1,
			2.3G1G+, 2.4G1, 2.5G+
			3.1+G2G+, 3.2+G1G+,
			3.3G1, 3.4G+
			4.1+G1G+, 4.2+G1,
			4.3G+
			5.1+G1, 5.2+G+
1940	9	5.4, 4.5	2.1+G3G1, 2.1+G2G1G+,
			2.1+G1G1G1,
			2.2+G1G1G+,
			2.3G1G1, 2.4G1G+, 2.5G1
			3.1+G2G1, 3.2+G1G1,
			3.3G1G+, 3.4G1, 3.5G+
			4.1+G1G1, 4.2+G1G+,
			4.3G1, 4.4G+
			5.1+G2, 5.1+G1G+,
			5.2+G1, 5.3G+
1941	10	5.5	2.1+G3G1G+,
			2.1+G2G1G1,
			2.1+G1G1G1G+,
			2.2+G1G1G1, 2.3G1G1G+,
			2.4G1G1, 2.5G1G+
			3.1+G2G1G+,
			3.2+G1G1G+, 3.3G1G1,
			3.4G1G+, 3.5G1
			4.1+G1G1G+, 4.2+G1G1,
			4.3G1G+, 4.4G1, 4.5G+
			5.1+G2G+, 5.1+G1G1,
			5.2+G1G+, 5.3G1, 5.4G+

I. Relative Frequency of the Year-Classes.

1. A Survey of the Factors Influencing the Frequency of the Year-Classes.

Eilert Sundt, a Norwegian clergyman, has concluded from population statistics that year-classes comprising an abundance of individuals retain this abundance throughout their life and at the same time give birth to new year-classes comprising an abundance of individuals, whereas year-classes comprising a small number of individuals retain the same relative size and give rise to further small year-classes. This rule of population statistics has been named after its originator.

Ichthyologists have observed that the same rule applies to fishes to a much greater extent than to human beings. Consequently the phenomenon must be considered as one of the basic reasons for the periodicity in fishing results: as such it has especial economic significance. This fact will be dealt with in this paper.

One of the basic conditions for the birth of a numerically important year-class is an abundant parent generation. Unless this is the case, the subsequent generation will be numerically unimportant. After the new generation is hatched, however, other factors may seriously diminish the number of fish which were produced. These restrictive, in some cases actively destructive, factors are due to external circumstances and generally to climatic conditions. Investigations can sometimes elucidate these conditions, but very seldom can anything be done to remove them. If we take into consideration stocks of animals or of plants of importance to the economic activity of man, a detailed knowledge of the factors restricting their reproduction is of use because it makes advance calculations possible and eventually enables us to counteract the inimical factors.

The yield of the salmon fisheries fluctuates greatly and two factors help to bring about this result. The first is the condition stated by the Eilert Sundt rule, whether a sufficiently abundant parent generation has spawned, and second whether the new generation develops under favourable conditions. If these conditions do not exist, a shortage will result.

Many factors of varying importance affect the hatching and survival of salmon. I intend to analyse the results of salmon fishing in the northern parts of Bothnian Bay during the last twenty years and I shall primarily explain the composition of the life-cycle classes of the catches and the conditions under which the different year-classes were hatched. I shall pay special attention to the probable abundance of the parent generation during the spawning periods, and to the water-level conditions prevailing during the time when the fertilized ova were in the bottom of the stream before hatching. The changes and fluctuations in these factors may have a decisive influence upon the size of the year-classes. Other restrictive factors may also exist especially at a later stage. Some of these are variations in the available food supply for both parr in the river and salmon in the sea, pollution of the rivers and changes in the fishing intensity which may tax the stock unduly for some reason or other. The author has not investigated the last possibility.

2. Periodicity and its Transitions.

In my earlier report I observed (l. c. pp. 38, 41—42 and 101) that, of the catches made in the Bothnian Bay region during the years 1921—35 when given in numbers and not in kilogrammes, one half, or 50·8%, was made up of the group A.3, i. e., fish which had spent three years in the sea before its first return to the river, and one fourth of the catches, or 24·9%, of the group A.2+. Thus these two groups represented three fourths of the catch (75·7%). The remaining fourth consisted of fish which had been in the sea one year, four years or five years, and of fish, which had already spawned; they thus belonged to the groups A.1+, A.4, A.5 and to the group marked G. Group A.1+ represented 10%, and groups A.4 and A.5 together another 10%: the previously spawned fish represented 5%.

The above-mentioned groups do not correspond to the year-classes, for the smolt-age of the salmon varies. I have shown (l. c. Tables 12—14, p. 40, 42—43 and 46—47) that the 50·8% represented by the group A.3 is divided in the following manner: 39·7% in the life-cycle class 3.3, 5·4% in the life-cycle class 2.3 and 5·7% in the life-cycle class 4.3.

The decrease in the value of the life-cycle class 3.3 which forms the majority in group A.3, due to the differing smolt-age, is compensated partly by the salmon which belong to the same age-class but are in other groups, primarily in A.4 and A.2+, because of their different smolt-ages — some of them are also in the group A.1+. In the former case the smolt-age lasted two and in the latter case as many as five years. From the observations made during the years 1921—35 (l. c. Tables 12—14, pp. 40, 42—43 and 46—47) we get the following percentages: the life-cycle class 2.4, 1·0%; the life-cycle class 4.2+, 5·7%; and the life-cycle class 5.1+, 0·4%; the sum of these is 7·1%. Thus the percentage of the year-class represented by the life-cycle class 3.3 has increased to 46·8% (39·7+7·1) or 4% less than the percentage of the A.3 group. *Consequently in a normal (average) catch the group A.3 may approximately represent the year-class which, after reaching the age of six years,*

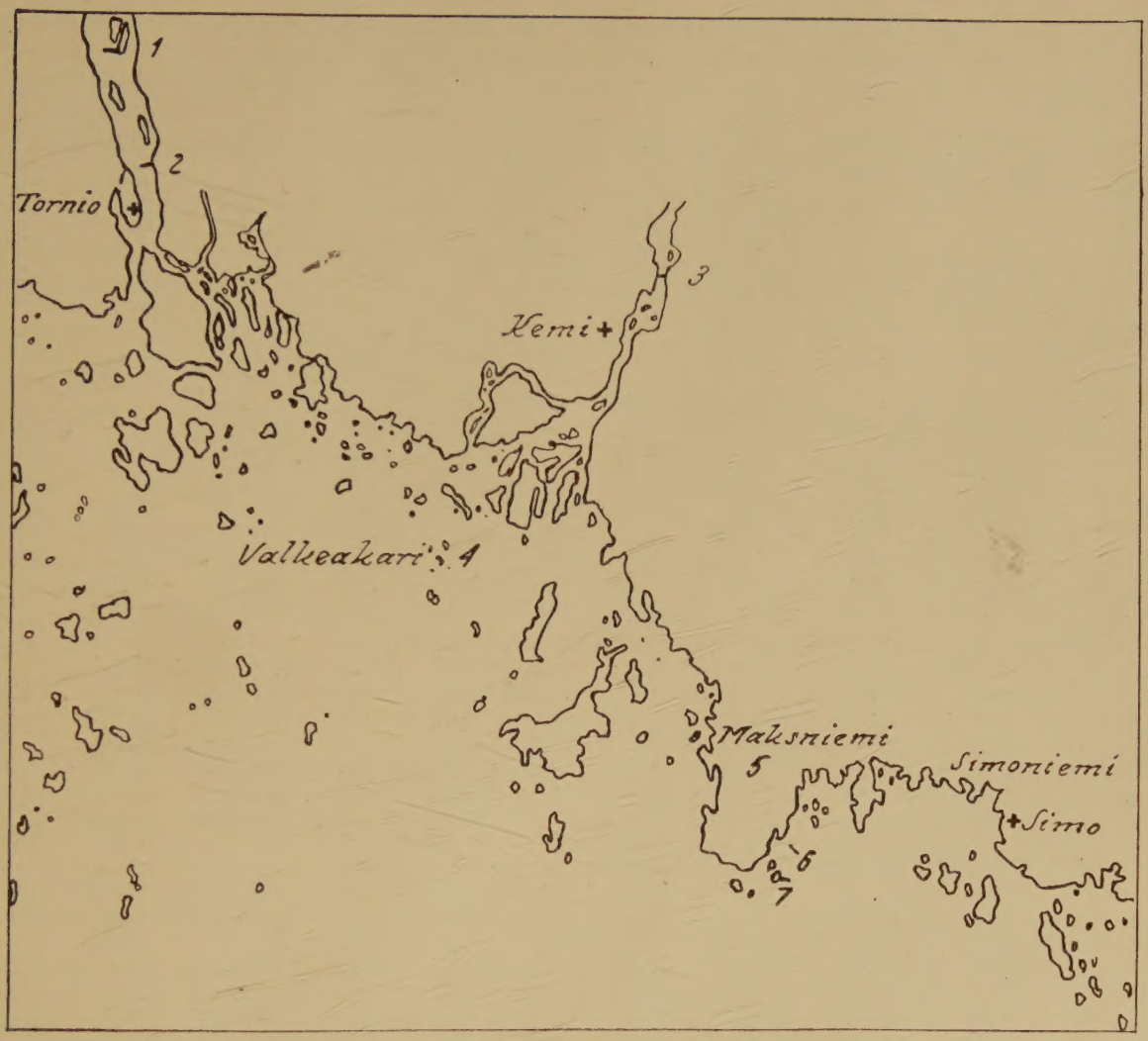

Fig. 2. Oulets af Tornio and Kemi Rivers, and the Archipelago at the Estuary.
1. Sumisaari weir in the Tornio River, 2. Kiviranta weir in the Tornio River, 3. Korva weir in the Kemi River, 4. Centre of the Valkeakari fishing grounds, 5. Maksniemi region in Simo Parish, 6. and 7. Röyttä and Halttari, the best salmon fishing sites in Finland.

is ascending the river during its seventh growth period. Working on the basis of this supposition I shall make an estimate of the salmon catch of different years.

In the particular case of the salmon catch from the Bothnian Bay region in the years 1936—44 the oldest ascending year-class in the group 3.3 is the class of 1929/1930. But since a corresponding estimation can be made also as regards the year-classes whose share in the catch we already know — as far as it is generally possible to know — I shall make a survey of the years which I have considered in detail in my earlier report (l. c.).

According to the Eilert Sundt rule the first requirement for the creation of a strong year-class is that the parent generation is numerous. We must therefore investigate the Bothnian Bay salmon region from that point of view during the years 1914 to 1937, since the brood of 1937 is the last which has had a significant influence upon the catches of 1944.

We may assume that, in the years when the catches were plentiful, the number of spawning fish was also considerable. But this rule may not be quite true, because other factors intervene, particularly as regards the amount of fishing in the rivers themselves. During the years in which the spring floods are small fishing

Table 1. Salmon Yield in the northern Bothnian Bay in the Years 1921—44.

A comparative Survey of the Catches during different Years.
(The Material of the years 1921—35 from the earlier report, l. c., Tab. 3, p. 12 and Tab. 28 A, pp. 84—85.)

The Catch-Years	The Difference between the Number of Salmon caught and Standard of Comparison: a in the Weight-Class 7·5–13·0 kg. (9·0–14·0 „)	The Difference between the Number of Salmon caught and Standard of Comparison: b the whole Yield	The Difference betw. the Weight (in '000 kg.) of the Yield and Standard of Comparison	The Mean Weight of the Salmon (kg.)	The Extreme Height of the Spring Flood as compared to the Average Level in 1921—1935: Tornio River	Kemi River	Oulu River	The Year-Class	In the Life-Cycle Class 3·3(+)	Classification in the 7th Year
The Standard of Comparison	**5165**	**9·802**	**87·2**	—	**292**	**580**	**280**			
Class **a**: The Good or Plus-Years. — As Parent Generation of great Frequency.										
1921	+2156[1])	+512[1])	+70·5[1])	9·7	—22	—44	—31	1921/1922	1928	Class b
1922	+3380[1])	—11[1])	+59·6[1])	10·3	—2	+180	+22	1922/1923	1929	Class c
1927	+2022[2])	+1451[2])	+4·4[2])	8·2	+28	+36	+22	1927/1928	**1934**	Class **a**
1934	+1359	+4465	+26·0	7·9	+58	+92	+39	1934/1935	**1941**	Class **a**
1936	+1500	+2511	+25·7	9·2	+56	—12	+13	1936/1937	**1943**	Class **a**
1941	+1811	+1139	+7·5	9·0	—25	—136	—142	1941/1942	(1948)	—
1942	(+4044)[3])	+5547	+29·9	7·4	—32	—96	—193	1942/1943	(1949)	—
1943	(+4785)[3])	+3829	+10·3	7.2	—10	+60		1943/1944	(1950)	—
Class **b**: The Average Years. — As Parent Generation of medium Frequency.										
1923	+704	—1050	—8·5	9·0	+4	+46	—5	1923/1924	**1930**	Class **b**
1928	+586	+2712	—4·7	8·5	—26	—192	—63	1928/1929	**1935**	Class **b**
1930	—409	+644	—4·3	9·3	+14	+40	—96	1930/1931	**1937**	Class **b**
1933	—879	+1516	—3·5	7·4	—40	—60	—23	1933/1934	**1940**	Class **b**
1935	—525	+130	—9·0	7·9	+61	+16	—20	1935/1936	1942	Class a
1937	+217	—1596	—7·9	10·6	—55	—120	—47	1937/1938	1944	Class c
1940	+39	+3398	+12·9	7·2	—14	—14	—8	1940/1941	(1947)	—
Class **c**: The Poor Years. — As deficient Parent Generation.										
1924	—302	—3278	—22·1	10·0	—4	+108	+99	1924/1925	**1931**	Class **c**
1925	—1905	—17	—17·3	7·1	—16	—42	—54	1925/1926	**1932**	Class **c**
1926	—2323	+477	—30·2	5·6	—24	—88	+22	1926/1927	1933	Class b
1929	—591	—1778	—15·5	10·3	+2	—42	+12	1929/1930	1936	Class a
1931	—1523	—1668	—23·7	7·8	—28	—20	+42	1931/1932	**1938**	Class **c**
1932	—403	—1787	—13·5	9·2	—8	—30	—10	1932/1933	**1939**	Class **c**
1938	—2827	—3482	—43·7	7·3	—8	—104	+62	1938/1939	(1945)	—
1939	—2378	+1564	—23·7	4·8	—37	—71	—62	1939/1940	(1946)	—
1944	(—2448)[3])	+7683	+9·5	5.5						

[1]) Statistics for the years 1921 and 1922 are lacking as regards the Maksniemi, Simo, Simoniemi and Kuivaniemi areas (and for the year 1921 also from the Ii area). As these gaps have not been filled, the yield of 1921 and 1922 in the Bothnian Bay area was greater than my figures indicate. When the information given in Table 10 (l. c. p. 20) is compared to the catches of the following years, we observe that the total yield of the year 1921 has been estimated in these countries to be 778·8 thousand kilos or about 175 % of the average yield of the years 1921—1935 (444·1 thousand kilos).

[2]) Statistics of the catches in the Maksniemi area for the year 1927 are also lacking, but in the calculations they have been regarded as equal to the total yield of the Simo and Simoniemi areas during the same year.

[3]) The figures are based upon the weight-group 4·0—8·5 kg. In consequence, many of the salmon of group A.3 belonged during 1942—44 to the lower weight-group owing to changes in the growth-rate (cf. Table 27, p. 63).

is more effective than in the years when floods are heavy and fishing is interrupted. The higher water levels in the rivers have also an effective influence in inducing the ascent of salmon from the sea. In any case during a period of high water greater numbers of salmon attain the upper reaches of the rivers, where the actual spawning places lie, than when the water is low.

In order to estimate the relative abundance of the ascent of salmon up the rivers each year from 1921 onwards I have drawn up Table 1. As a starting point I have used the statistics from the fishing grounds let out by the State in the Bothnian Bay region (l. c. Tab. 28 A pp. 84—85; and also Tab. 22 in this report). The catches are recorded in the tables by weight and numbers; they are also divided into weight-classes.

The most important weight-class is that of 7·5—13 kg. (from the year 1936 onwards 9—14 kg.), because it corresponds to the group A.3. In Tab. 1 I do not

express the above-mentioned facts in absolute figures but in proportion to the average results of the years 1921—1935, viz., (*a*) total weight of the catches: 87,200 kg., (*b*) number of salmon: 9802 and (*c*) number of salmon in the weight-class 7·5—13 kg. (9—14 kg.): 5165. The characteristics of the individual years are expressed as above or below (+ or —) these averages. The value of each year is classified in three different groups. The first group, the *a*, or plus class, comprises the years in which the salmon yield has exceeded to a considerable extent the mean value of the catches of the years 1921—1935 in both weight and numbers. The middle group, class *b*, consists of the years in which the catches approximate to the average of the years 1921—1935. Finally the third group — class *c* — includes the years in which the catches are considerably smaller than the average.

It has not been possible to apply this basis of classification to the years 1942, 1943 and 1944 because a decrease in size of the salmon during these years has led to confusion in the weight-classes: owing to poor growth a significant part of the group A.3 has been transferred to a lower weight-class which is chiefly composed of the A.2+ group: a part of this latter group again has had to be included in a still lower weight-class (cf. pp. 52 and 59). In order to avoid the difficulties arising from these changes, I have used a different method for estimating the catches of the years 1942, 1943 and 1944. For these years I have disregarded the weight-classes and have taken as my starting point the total catch of the different fishing seasons. I have divided the total into age-groups according to my scale analysis and I have assumed that the A.3 group corresponds to the 7·5—13 kg. weight-group of the earlier years. The comparison for the years 1942, 1943 and 1944 is made on this basis[1]).

In addition for the years 1921—1935 the highest levels are compared with the mean levels of the spring floods in the lower reaches of the Tornio River and the Kemi River (above the Kukkola Rapids and below the Taivalkoski Rapids) and of the lower reach of the Oulu River (at Muhos). But the length of the flood seasons has not been noted.

The years 1914—1920 are not included in Table 1, because we have not the statistics. In order, however, to get a basis for comparison I have used the official statistics of Finland and Sweden for the salmon catches in the Baltic during these years. The total salmon catches in these countries were as follows:—

Year	'000 kg.	Year	'000 kg.
1914	250 (108+142)	1918	249 (137+112)
1915	309 (152+157)	1919	359 (145+214)
1916	367 (256+111)	1920	512 (200+312)
1917	334 (168+166)		

On the basis of these statistics the catches in the Bothnian Bay area in 1920 have been held to be abundant, in 1915, 1916 and 1917 to be average and in 1914 and 1918 to be poor.

The river water levels in the relevant years during the period when the fertilized ova were developing are presented in Table 2. The observation stations are the same as those of Table 1. Since we do not know the exact dates of each year's spawning seasons they are presumed to have begun about October 10th in the Tornio and Kemi Rivers and about October 20th in the Oulu River. The maximum and minimum heights of the water level have been given monthly. The fluctuations in the water level conditions of the Tornio River (at the Kukkola Rapids), in the Kemi River (at the Taivalkoski Rapids) and in the Oulu River (at the Sotkajärvi) have been expressed in curves in the appendices to this report. A level line has also been drawn to represent the water level at spawning time; this line shows whether and to what extent the water level prevailing later, until the spring, was higher ("high level") or lower ("low level") than that prevailing during the spawning period.

In Tab. 2 I have also tried to give the prevailing frost conditions. They are partly revealed by the dates of the beginning of the freezing period and the breaking-up of the ice. Perhaps the general frost conditions are best illustrated by the total of the degrees of frost on the days (one observation per day) when the temperature was below 0° C.

Some notes are necessary before we survey the results given in Tab. 1 and 2. The classification of catches in Tab. 1 is based upon the statistics obtained from the fishing grounds which are owned by the State in the northern regions of the Bothnian Bay and are rented to fishermen. Although these statistics may not be absolutely precise in every respect, they may be depended upon to a considerable extent as far as the number of salmon and the total weight of the catches is concerned (some small parts of the catches may have been left out). On the other hand there may be errors in the classification of the salmon in different weight-classes since the salmon were not weighed separately. At the larger fishing grounds, the greater part of the catches have not been weighed individually but they have been divided into weight-classes merely by measuring with the eye; thus the distinctions have not been exact. Further the weight-classes determined in this fashion do not correspond

(Cont. page 14)

[1]) The calculations in detail are as follows:
Year 1942. Number of salmon 15,349. Those belonging to group A.3 60% or 9209 fish. The ratio to the standard of comparison (=5165) +4044.
Year 1943. Number of salmon 13,631. Those belonging to group A.3 73% or 9950 fish. The ratio to the standard of comparison: +4785.
Year 1944. Number of salmon 17,485. Those belonging to group A.3 14% or 2448 fish. The ratio to the standard of comparison: —2717. (The size of the total catch is due to the abundance of the groups A.2+ and A.4: group A.2+ form 42% and A.4 33·5% of the total. cf. Tab. 9, p. 32).

Table 2. **Water Level in the Tornio, Kemi and Oulu Rivers and the Frost**

Water Levels indicated monthly by

Year and Months

Fluctuations in the Water Level. —

10.–12. 1.–4.	Tornio River: Kukkola Rapids		Kemi River: Taivalkoski Rapids	
	Class **a.** *Parent Stock of great Frequency.*			
1920:	100[1])→73, 79→50, 67→117,	9.11[3])	193→142, 132→164, 100→144,	—
1921:	95→76, 73→57, 56→62, 49→169	29.4.[4])	130→238, 254→230, 232→193, 195→408	25.4
	"Low Water" about 25—40 cm., App.[1])		"Low Water" in the Autumn, "High Water" January—April.	
1921:	129→148→79, 79→122→95, 115→155,	21.10.	252→286→182, 182→440, 400→372,	24/10, 6/11,
1922:	128→94, 92→74, 77→68, 67→93.	7.5.	396→376, 394→380, 378→330, 328→276.	4.5.
	"Low Water", some exceptions in the Autumn.		Abundant "High Water" except at the End of Oct. and in the Beginning of Nov.	
1922:	115→79, 65→109, 137→96,	24.10.	136→165→116, 100→177, 184→274,	28.-31.10.
1923:	94→85, 84→70, 70→62, 61→52.	20.5.	225→256, 275→212, 218→150, 160→151→160	20.5.
	"Low Water", Exceptions in the Autumn.		Abundant "High Water", except at the End of Oct. and in the Beginning of Nov.	
1927:	150→46, 70→107, 68→113,	—	232→200, 200→294, 272→258,	19.10.
1928:	89→54, 53→60, 55→48, 48→110.	6.-15.5.	272→262, 260→238, 239→220, 220→236.	5.5.
	"Low Water" the whole Winter.		"High Water" except at the End of Oct. and in the Beginning af Nov.	
1934:	145→152→112, 154→90, 146→93,	5.11.	182→202, 232→140, 152→268,	6.11.
1935:	95→117, 118→105, 105→84, 83→108.	16.-25.5.	268→222, 256→239, 239→186, 184→218.	20.5.
	"Low Water" (in Autumn the "Equal Water" at times).		"High Water", a very small difference in Nov.	
1936:	91→54→96, 73→138, 138→96,	20.10.	137→172, 178→300, 158→278,	26.12.
1937:	95→146, 132→78, 76→83, 77→228.	1.5.	280→200, 218→178, 176→126, 126→451.	23.4.
	"High Water", March—April the "Equal Water".		"High Water" the whole Winter.	
1941:	103→62, 47→85, 97→59,	14.10.	159→116→184, 188→234, 235→189,	15.11.
1942:	56→32,	11.-24.5.	180→196, 189→220, 212→190, — —, 215→395,	15.5.
	"Low Water" the whole Winter.		"High Water" the whole Winter.	
	Class **b.** *Parent Stock of medium Frequency.*			
1915:	69→40, 22→94, 109→47,	26/10, 16/12.	126→138→108, 112→160, 162→264,	6.-12.12.
1916:	47→54, 51→59, 52→46, 35→120.	10.-16.5.	268→250, 248→216, 212→190, 192→306.	9.-11.5.
	The greatest "Low Water" in Nov. (—47 cm.).		"High Water" except Oct.—Nov.	
1916:	37→24, 36→65, 47→104,	2.-7.10.	130→96, 96→164, 120→188,	20.10.
1917:	103→52, 52→40, 49→45, 54→28.	23.-27.5.	190→246, 216→168, 196→158, 140→206.	17.5.
	"High Water", except at End of Oct.		"High Water", except at the End of Oct. and in the Beginning of Nov. and Dec.	
1917:	125→190, 175→130, 186→127,	21.11.	298→442, 233→500, 490→620,	22.11.
1918:	145→92, 91→84, 86→75, 74→103.	18.-21.5.	588→450, 446→395, 393→346, 361→314.	19.5.
	"High Water" in the Autumn, "Low Water" from Jan. on.		Abundant "High Water", except for a short Interval in Nov.	
1923:	165→138, 107→160, 164→112,	28.10.	278→288→235, 235→588, 582→376,	24.11.
1924:	162→116, 115→82, 83→77, 75→82	14.-17.5.	374→280, 280→250, 250→220, 220→201.	14.-22.5.
	"Low Water", "Equal Water" twice.		Slight "Low Water" Oct.—Nov. and in Apr. at other times "High Water".	
1928:	98→55, 88→125, 85→122,	6.10.	158→124, 130→355, 296→288,	c. 11.10.
1929:	127→94, 95→80, 80→66, 63→21.	17.5.	258→276, 272→282, 274→178, 176→150.	15.-20.5.
	"Equal Water" except in Oct. and from March on.		"High Water" except at the End of Oct. and the Beginning of Nov.	

[1]) In the series regarding Tornio and Kemi River the first observation has been noted on October 10th, regarding Oulu River on October 20th.
[2]) In this table, "High Water", "Low Water", and "Equal Water" denote such a water as has been higher, lower, or at the same height respectively as the water level in the Tornio and Kemi Rivers on October the 10th and in the Oulu River on Oct. the 20th.
[3]) The Date of Freezing.

Conditions (in Oulu) from October to April in the Years 1914—1944.
Maximum and Minimum Figures.

Freezing and the Breaking-Up of the Ice.

Oulu River: Muhos (and Sotkajärvi)		Degrees below Zero Totals	Classification of the Year-Class at the Stage 3·3(+)
98→88, 92→145, 128→239,	12/11, 21/12.	118° C	
190→284, 195→169, 167→115, 120→247.	14.-16.4.	681° C	
Abundant "High Water" especially in the middle of Winter.		799° C	Class **a** (**1927**)
187→202, 209→298, 277→250,	29/10, 8/11.	497° C	
249→228, 234→197, 195→153, 137→287.	4.-6.5.	878° C	
Slight "High Water", March—April "Low Water".		1375° C	Class *b* (1928)
122→109, 190→144, 169→180,	21.11.	468° C	
176→148, 146→133, 132→111, 110→94.	12.-14.5.	780° C	
"High Water" at Muhos, "Low Water" in Sotkajärvi.		1248° C	Class *c* (1929)
129→195, 219→177, 175→148,	29/10, 2/12.	622° C	
147→131, 130→112, 112→99, 98→288.	29/4-1/5.	748° C	
"High Water" in the Beginning, "Low Water" from Febr. on.		1370° C	Class **a** (**1934**)
175→203, 195→226, 198→305,	28.-29.12.	172° C	
305→240, 249→202, 216→149, 145→249.	1.-5.5.	713° C	
At Muhos "High Water", March—April little "Low Water"; In Sotkajärvi "High Water" the whole time		885° C	Class **a** (**1941**)[5]
111→139, 116→181, 225→154,	21/10, 28/12, 8/1.	95° C	
195→152, 175→151, 158→126, 117→233.	24.4.	706° C	
"High Water" the whole Winter (Muhos), in Sotkajärvi smaller extent.		801° C	Class **a** (**1943**)
78→79, 76→79, 79→75,	11.-30.10.	732° C	
64→59, 60→53, 53→56, 55→125.		1349° C	
"Equal Water" in the Autumn, then slight "Low Water". — The Water-Level generally low.		2081° C	(1948)
71→98, 104→79, 81→68,	6.11.	771° C	
68→64, 64→62, 62→59, 57→306.	30.4.	639° C	
"Low Water", small Fluctuations.		1410° C	Class *a* (1922)
64→84, 59→134, 136→103→136,	19.12.	211° C	
137→122, 122→116, 116→108, 102, 202.	15.5.	1197° C	
"High Water", except Oct. and Nov.		1408° C	Class **b** (**1923**)
115→184, 184→350, 352→300,	25.11.	286° C	
— —, 278→251, 251→236, 235→164.	27.4	827° C	
Abundant "High Water".		1113° C	Class *c* (1924)
198→242, 219→272, 212→269,	26.12.	356° C	
273→229, 228→210, 209→174, 173→159	6.-14.4.	860° C	
"High Water", except March—April, in Sotkajärvi similarly.		1216° C	Class **b** (**1930**)
112→142, 135→235, 180→231,	6.11.	335° C	
254→202, 202→198, 198→174, 173→151	12.-13.5.	1035° C	
"High Water" in Muhos, "Equal Water" in Sotkajärvi.		1370° C	Class **b** (**1935**)

[4]) The Date of Breaking-Up of the Ice.
[5]) At the end of April 1938 great quantities of salmon weighing from 700 to 800 gr. which were caught in the sea off Pori and Kristiina were sent to Helsinki to be sold. Judging from the size these salmon belonged to the year-class 1934/35 at the stage 3 +. At the same time the yield of small salmon was very bad on the south coast of Sweden (the east coast of Skåne). Cf. Sv. Fiskeritidskr., 1938, p. 145.

(Cont. pages 14—15)

Table 2

Year and Months 10.–12. 1.–4.	Tornio River: Kukkola Rapids		Kemi River: Taivalkoski Rapids	
1930:	49→120, 151→110, 109→143,	6.10.	108→206, 212→566, 594→402,	17.11.
1931:	143→86, 87→77, 78→67, 67→96.	8.-12.5.	402→366, 364→345, 343→308, 270→477.	5.5.
	"High Water" throughout the whole Winter.		"High Water", mostly very abundant.	
1933:	71→101→44, 55→94, 70→57,	26/10., 10/11.	112→188, 90→250, 237→197,	7.11.
1934:	68→62, 58→64, 63→74, 72→61	8.5.	198→170, 182→218, 204→172, 170→195.	7.5.
	Mostly "Equal Water" or slight "Low Water".		"High Water" the whole Winter except once in Nov.	
1935:	145→169, 177→118, 109→170,	29/9., 19/12.	290→338, 316→194, 180→262,	—
1936:	129→156, 140→105, 104→87, 84→122.	15/4.8/5.	202→258, 254→285, 270→200, 150→400.	19.4.
	Mostly the "Equal Water".		"Low Water" except at the End of Oct. and the Beginning of Nov.	
1937:	90→68, 87→25, 73→119,	19.11.	79→140, 168→118, 124→238,	16.11.
1938:	86→105, 88→66, 62→69, 60→82.	8.-12.5.	238→292, 240→146, 144→114, 125→172.	8.5.
	"Low Water" in Autumn (Nov.) and from Febr. on.		Abundant "High Water" the whole Winter.	
1940:	152→92, 118→86, 106→150,	23.-28.10.	236→134, 116→280, 322→257,	5.11.
1941:	119→68, 80→73, 81→72, 72→62.	6.-27.5.	254→220, 218→172, 175→158, 152→168.	—
	"Low Water" the whole Winter.		"Low Water" Oct.—Nov. and from Jan. on.	

with the age-groups — i. e., the groups A.1+, A.2+, A.3 and A.4 — as well as I would have expected. Changes have appeared in this respect, especially since 1942, which have been mentioned and which will be explained later in detail (cf. pp. 52 and 59). In addition I have changed the limits of the weight-classes of the year 1936 (i. e., the 7·5 kg. inferior limit has been changed to 9·0 kg. and the 13 kg. superior limit to 14 kg.). Consequently the numbers included in the weight-classes 7·5—13·0 (9·0—14·0) kg. must be regarded as only an approximation.

The mean weight of the salmon again indicates whether the older or the younger life-cycle classes have formed the main part of the catches.

Tab. 1 gives no decisive information regarding the influence of the spring floods upon the ascent of the salmon. In certain years (e. g. 1927 and 1934 and perhaps 1936) when the catches have been good the spring floods have also been high. But during the last "good" years the water level has been low even during the flood season. Although the spring floods have been small during several bad salmon summers, there is no reason to attribute the scarcity to this fact; the high water level in the year 1924 in the Kemi and Oulu Rivers did not produce abundant catches. The influence of the spring floods may be of only secondary importance, for when the stock is poor the flood water with all its possible attractions cannot produce a good catch. *Abundant flood water can become an effective factor only during the years when the stock is good.*

In Tab. 1 and 2 we can compare the catch group —i. e., classes *a*, *b*, or *c*—to which the catch of any particular year belongs with the catch group of the year from which the principal component (the A.3(+) group) of the catch originated. The latter year was, of course, seven years before the former year. *We then make the very significant observation that, in a considerable number of cases, the catch groups are the same in both years.*

Tab. 2 shows that of the catches derived from *six* previous years' catches in class *a*, *four* are again included in the same class, one is in class *b* and one in class *c*; of the catches derived from nine previous years belonging to class *b*; *five* are again in class *b*, two are in class *a* and two in class *c*; and of the catches derived from nine previous years in class *c*, *six* are again in class *c*, two are in class *a* and one in class *b*. Summing up we find that the class group of the parent year has been repeated by the succeeding generation in *fifteen out of twenty-four cases. In five* cases the succeeding generation is better than the parent generation and in *four* cases it is worse.

When the different cases are examined more closely, it is seen that the year-class 1920/1921 (derived from ova deposited in the autumn of 1920, which was a good salmon year) gave, in the seventh year, 1927, catches which fell into the *a*, or plus class. From the salmon spawning in that year the year-class 1927/1928 originated. The representatives of that year-class returned in their seventh year, i. e., in 1934; this year also fell into the *a*, or plus class. Further, the offspring of the autumn of 1934, or the year-class 1934/1935, returned in 1941 and the catches of this summer again belonged to the *a*, or plus class. Thus there has been a corresponding catch group four times in succession — counted in generations.

In 1916 the catches were in class *b*; the catches

(continued).

Oulu River: Muhos (and Sotkajärvi)		Degrees below Zero Totals	Classification of the Year-Class at the Stage 3·3(+)
45→74, 74→221, 222→179,	17.10., 18.12., 5.2.	381° C	
206→187, 187→178, 178→158, 131→359.	30.4-3.5.	946° C	
Very abundant "High Water".		1327° C	Class **b** (**1937**)
140→140, 133→244, 214→188,	21.1.	386° C	
201→162, 170→152, 160→126, 115→273.	23.-27.4.	544° C	
"High Water"; "Low Water" March—April.		930° C	Class **b** (**1940**)
187→208, 216→255, 235→296,	—	138° C	
247→334, 317→278, 278→205, 175→363.	29.4.-3/5.	1048° C	
"High Water" both at Muhos and in Sotkajärvi.		1186° C	Class *a* (1942)
71→82, 82→148, 156→127,	3.12.	305° C	
125→127, 127→112, 114→96, 99→140.	29.4.-3.5.	487° C	
"High Water" though in smaller degree.		792° C	Class *c* (1944)
128→110, 109→219, 199→223,	5.11., 13.12.	376° C	
214→194, 194→150, 148→111, 115→110.	16.-17.5.	1094° C	
Partly "High" and partly "Equal Water".		1470° C	— (1947)

(Cont. pages 16—17)

in 1923 (from the year-class 1916/1917) fell into the same class. The year-class 1923/1924 was in its seventh year in 1930 and the catches of 1930 also fell into class *b*. The year-class 1930/1931 was in its seventh year in 1937; the catches of that year again fell into class *b*. Thus the catches from four year-classes, generation after generation in succession, have belonged to the same class.

The salmon catches of 1918 were poor and were in the *c*, or minus class. The year-class 1918/1919 in its seventh year in 1925 also fell into the *c* class. The new year-class 1925/1926 in 1932 and the year-class 1932/1933 in 1939 both belonged also to class *c*. Thus four successive generations were again alike.

In all the above-mentioned cases a parent generation of a certain class of catch year (a, b, or c) has for four generations, with seven years intervals, yielded a catch year of the same class.

As mentioned above, transitions from one catch class to another occurred *only in nine cases*. The transition has been from *a* to *c* or the reverse in *three* cases; in other cases the transition was to the next class.

The following were the three extreme cases. The catches in 1936 from the year-class 1929/1930, belonged to the *a*, or plus class, although the catches of 1929 had only been in the *c*, or minus class.

A similar transition took place with regard to year-class 1914/1915. The catch in 1921 fell into class *a*, although the catch of 1914 corresponded undoubtedly to class *c*. The transition of year-class 1922/1923 was in the opposite direction: the catch of 1922 belonged to class *a*, but the year-class born from the spawn of that year fell into class *c* in 1929.

There has been a rise from the lower class to the next in the cases of the year-classes 1915/1916, 1926/1927 and 1935/1936 when they took their share in the catch in 1922, 1933 and 1942 respectively; in the first and third cases the transition has been from class *b* to class *a*, and in the second case from class *c* to class *b*.

A descent from one class to the next lower class, occurred in the cases of the year-classes 1921/1922, 1917/1918 and 1937/1938, which brought about the transition of the catch of the year 1928 from class *a* to class *b* and of the years 1924 and 1944 from class *b* to class *c*.

Shorter periods (of fewer generations) are formed in class *a* by the years 1936 and 1943, in class *b* by the years 1933 and 1940, and in class *c* by the years 1919 and 1926 and a three-generation period by the years 1924, 1931 and 1938.

Table 2

Year and Months 10.–12. 1.–4.	Tornio River: Kukkola Rapids		Kemi River: Taivalkoski Rapids	
	Class **c.** *Parent Stock insufficient* (small).			
1914:	93→41, 15→88, 60→108,	6.10.	162→120, 90→138, 138→200,	7.11.
1915:	63→79, 65→53, 53→43, 46→83.	12.-17.5.	200→276, 282→244, 242→196, 190→332.	1.5.
	"Low Water" except in Dec.		"High Water" except Oct.—Nov.	
1918:	140→105, 149→77, 93→142,	13.11.	204→275, 278→143, 112→360,	13.12.
1919:	130→106, 109→73, 73→62, 60→66.	12.5.	320→280, 284→262, 272→239, 218→248.	12.5.
	"Low Water" fluctuating every Month, most March—April.		"High Water" except at the End of Nov. and in the Beginning of Dec.	
1919:	158→106, 81→109, 123→81,	26.10.	287→190, 192→392, 324→269,	3.11.
1920:	81→67, 65→71, 66→74, 74→130.	10.5.	270→251, 266→240, 238→215, 228→432.	24.4.
	"Low Water" throughout the whole Winter.		Mostly "Low Water", "High Water" at the End of Nov. and in the Beginning of Dec.	
1924:	130→150, 156→112, 152→100,	4.11.	188→223, 239→153, 151→206,	4.-14.11.
1925:	110→96, 135→89, 88→72, 72→159.	11.-16.5.	200→256, 355→242, 300→242, 204→334.	8.5.
	"Low Water" during parts of Nov. and Dec., more abundantly in the middle and at the End of Winter.		"High Water" except at the End of Nov. and in the Beginning of Dec.	
1925:	111→43, 53→97, 135→98,	12.10.	176→132, 141→298, 334→294,	31.10.
1926:	101→67, 66→57, 61→54, 54→78.	15.-18.5.	294→274, 278→254, 250→150, 146→235.	7.-17.5.
	"Low Water", in Dec. "High Water".		"High Water" except Oct.—Nov. and March—Apr.	
1926:	103→172→90, 120→79, 150→104,	26.10.	184→246→140, 356→198, 228→300,	23.10.
1927:	104→82, 84→78, 80→64, 65→56.	20.-22.5.	314→275, 270→192, 190→142, 142→120.	17.-21.5.
	"Equal or High Water" in the Autumn, "Low Water" from Jan. on.		"High Water" except at the End of Oct. and the End of March and in Beginning of Apr.	
1929:	136→91, 162→123, 110→158,	—	212→285, 295→230, 203→232,	20.11.
1930:	100→161, 163→84, 86→68, 56→95.	8.-12.5.	178→310, 325→315, 310→248, 246→187.	4.-6.5.
	Mostly "High Water" in the Autumn, "Low Water" from the End of Febr. on.		"High Water" except in the Beginning of Jan.	
1931:	134→140→75, 85→114, 70→155,	22.-26.10.	231→256, 186→252, 226→474,	25.10.
1932:	114→78, 78→90, 85→79, 64→101.	12.5.	360→192, 184→214, 214→230, 230→315.	25.4.-13.5.
	"Low Water" every month, "High Water" round Dec. and Jan.		"High Water" except at the Beginning of Nov. and in Febr.	
1932:	158→186→124, 138→100, 90→150,	13.12.	350→428→308, 298→173, 170→295,	28.10→
1933:	89→130, 145→94, 93→83, 68→99.	12.5.	242→434, 360→296, 293→250, 244→400.	10.5.
	"Low Water" almost the whole Winter.		"Low Water" almost the whole Winter.	
1938:	106→138, 136→100, 144→107,	8.11., 18.12.	230→242→200, 242→177, 209→274,	17.12.
1939:	140→100, 98→79, 78→66, 67→56.	14.-20.5.	311→266, 268→310, 286→220, 220→170.	16.5.
	"High and Equal Water", from Febr. on "Low Water".		"High Water" except at the end of Nov. and in the Beginning of Dec.	
1939:	71→22, 23→76, 66→106,	19.11.	131→104, 109→170, 139→212,	—
1940:	103→60, 59→50, 52→10, 25→73.	9.-15.5.	257→224, — —, — —, 205→252.	—
	"Low Water" Oct. and Nov. and from Jan. on.		"High Water" from Nov. on.	

As a complement to the general survey the periods and transitions presented in Tables 1 and 2 are shown in the following summaries:

A. Periods:

In class *a*: 1. period: summer[1]) 1920 → summer 1927 → summer 1934 → summer 1941
2. period: summer 1936 → summer 1943

In class *b*: 1. period: summer 1916 → summer 1923 → summer 1930 → summer 1937
2. period: summer 1928 → summer 1935
3. period: summer 1933 → summer 1940

[1]) Note: See page 19.

(continued).

Oulu River: Muhos (and Sotkajärvi)		Degrees below Zero Totals	Classification of the Year-Class at the Stage 3.3(+)
102→96, 89→170, 130→180,	25.11.	171° C	
171→165, 165→157, 157→142, 138→220.	27.4.	939° C	
Mostly "High Water".		1110° C	Class *a* (1921)
150→166, 166→221, 209→229,	9.12.	192° C	
226→201, 200→178, 176→161, 146→233.	—	849° C	
"High Water" until April.		1041° C	Class **c** (**1925**)
146→172, 152→252, 247→190,	16.11.	493° C	
189→183, 183→155, 154→128, 143→368.	19.4.	501° C	
"High Water" until March.		994° C	Class **c** (**1926**)
97→94, 106→82→106, 108→149,	29.11.	206° C	
142→118, 117→97, 101→94, 92→249.	19.-21.4.	446° C	
Slight "High Water" at Muhos, slight "Low Water" in Sotkajärvi.		652° C	Class **c** (**1931**)
64→92, 81→147, 146→142,	9.11.	579° C	
144→138, 141→135, 140→124, 118→287.	3.-4.5.	964° C	
"High Water" at Muhos, "Equal Water" in Sotkajärvi from Febr. on.		1543° C	Class **c** (**1932**)
113→152, 111→217, 202→212,	29.10., 28.11.	448° C	
210→193, 192→177, 178→154, 153→124.	8.-11.5.	778° C	
"High Water" at Muhos, also in Sotkajärvi except March—April.		1226° C	Class *b* (1933)
180→179, 179→232, 232→217,	16/12, 14/1	66° C	
211→340, 343→269, 268→202, 197→122.	6.-18.4.	505° C	
"High Water" except in April, in Sotkajärvi "Low Water" from March on.		571° C	Class *a* (1936)
213→198, 232→194, 208→350,	30.12.	275° C	
346→260, 258→211, 210→155, 154→248.	24.-29.4.	603° C	
"Equal Water", at the End "Low Water"; in Sotkajärvi "Low Water" already from Febr. on.		878° C	Class **c** (**1938**)
296→317, 213→320, 301→206,	16.11.	104° C	
192→306, 326→291, 294→195, 172→257.	26.4.	766° C	
"Low Water" Nov., Dec., in Beg. of Jan., March a. Apr. — In Sotkajärvi "Low Water" abundantly.		870° C	Class **c** (**1939**)
110→100, 97→126, 51→142,	15.-20.12.	185° C	
150→180, 165→141, 139→115, 111→210.	29.4-3.5.	585° C	
Water at a low level; mostly "Equal Water".		770° C	— (1945)
54→46, 46→169, 158→192,	21.11., 7.12.	259° C	
162→180, 165→134, 133→122, 118→150.	7.-8.5.	1269° C	
Water at a very low level, nevertheless "High Water" occurred.		1528° C	— (1946)

In class *c*: 1. period: summer 1918→summer 1925→summer 1932→summer 1939
2. period: summer 1919→summer 1926
3. period: summer 1924→summer 1931→summer 1938.

B. Transitions:

1. From a lower class to a higher one (rises):

From class *c* to class *a*: summer 1914 (class *c*)→summer 1921 (class *a*)
similarly: summer 1929 (class *c*)→summer 1936 (class *a*)

From class *b* to class *a*: summer 1915 (class *b*)→summer 1922 (class *a*)
similarly: summer 1935 (class *b*)→summer 1942 (class *a*)

From class *c* to class *b*: summer 1926 (class *c*)→summer 1933 (class *b*)

2. From a higher class to a lower one (descents):

From class *a* to class *c*: summer 1922 (class *a*) → summer 1929 (class *c*)
From class *a* to class *b*: summer 1921 (class *a*) → summer 1928 (class *b*)
similarly: summer 1937 (class *b*) → summer 1944 (class *c*) with respect to the year-class of 1937/1938)

The foregoing survey of the seven-year periodicity in the Bothnian Bay stock shows that in this area *the Eilert Sundt rule concerning the decisive influence of the size of the parent generation upon the succeeding generations holds good in the case of the salmon.* In *fifteen* cases out of *twenty-four* (excluding the first year of the periods), the new year-class has proved to be consistent with the Eilert Sundt rule, whereas in *nine* cases other factors have caused a departure from the rule.

These facts teach us how important it is for the commercial fishery that sufficient salmon reach the spawning grounds: or, in other words, over-fishing ultimately penalises the fisherman.

On the basis of the foregoing results the following general rule can be set forth: *a, or plus classes, when reproducing themselves form maximum series, c classes form minimum series and b classes average series. Each series ends when the new year-class goes over to another frequency class. A year-class which has left the class of its parent generation may remain isolated or it may generate a new series, if the year-class it produces remains in the same class. The duration of a series thus depends upon how many generations recur in the same class according to the Eilert Sundt rule.*

The periods and the year-classes are set forth in the following table in chronological order. The former are to be read horizontally, and the latter vertically. The transition of the periods is printed in bold faced types.

Table 3. Number of Specimens investigated

(l. c. Table 11, p. 20).

Year	Tornio River Kivirante	Kemi Valkeakari and others	Kemi River Köngäs Muurola	Oulu River	Kokemäki River	Kymi River	Total
1936	2261	1106	418	1462	277	310	**5834**
1937	341	694	144	517	168	70	**1934**
1938	541	571	360	601	125	56	**2254**
1939	2025	1209	461	455	60	17	**4227**
1940	2497	712	407	311	70	—	**3997**
1941	899	—	352	166	5	—	**1422**
1942	2248	86	291	321	44	—	**2990**
1943	1812	597	412	(183)	—	8	**3012**
1944	3486	69	297	749	—	—	**4601**
Total	16110	5044	3142	4765	749	461	**30271**
Percentage	53·2	16·7	10·4	15·7	2·5	1·5	

The last collection from Valkeakari was taken up in 1940. The other collections from fishing grounds in the sea are in 1942 and 1944 from the parish Ii and in 1943 partly from Simoniemi in the parish Simo, partly from Pensaskari fishing ground in the parish Alatornio.

1. 1907/08: 1914 class *c* → 1914/15: 1921 class **a** → 1921/22: 1928 class **b** → 1928/29: 1935 class *b* →
2. 1908/09: 1915 class *b* → 1915/16: 1922 class **a** → 1922/23: 1929 class **c** → 1929/30: 1936 class **a** → } →
3. 1909/10: 1916 class *b* → 1916/17: 1923 class *b* → 1923/24: 1930 class *b* → 1930/31: 1937 class *b* →
4. 1910/11: 1917 class *b* → 1917/18: 1924 class **c** → 1924/25: 1931 class *c* → 1931/32: 1938 class *c*.
5. 1911/12: 1918 class *c* → 1918/19: 1925 class *c* → 1925/26: 1932 class *c* → 1932/33: 1939 class *c*.
6. 1912/13: 1919 class *c* → 1919/20: 1926 class *c* → 1926/27: 1933 class *b* → 1933/34: 1940 class *b*.
7. 1913/14: 1920 class *a* → 1920/21: 1927 class *a* → 1927/28: 1934 class *a* → 1934/35: 1941 class *a*.

2. 1935/1936: 1942 class **a**.
3. 1936/1937: 1943 class *a*.
1. 1937/1938: 1944 class *c*.

3. Analysis of the Age- and Life-Cycle Classes during the Years 1936 to 1944 in the Bothnian Bay Area.

The catch of salmon in the Bothnian Bay area is so great, even under present conditions, that a detailed survey of the age- and life-cycle classes can be made of only a fraction of it. The statistical material used in this investigation is thoroughly representative of the whole stock. The observation stations from which the material has been collected have been listed in the foreword. Table 3 gives the number of salmon which have been measured and weighed and from which scale samples have been taken. The figures in this table reveal the difference between the catches of different years and show that the statistics collected from the Tornio River are the most important.

The division of the salmon into age- and life-cycle classes is given in detail in Tables 4—8 as regards both numbers and percentages. The number of the salmon, which have spent an equal length of time in the sea are also recorded without regard to smolt-age, that is, they are united in the following groups — A.1+, A.2+, A.3, A.4 and A.5. In the appendices to each table the manifold variety of the life-cycle classes of salmon which have spawned once, or more than once, is shown.

Tables 9 and 10 summarise the results obtained from different observation stations and in different years. Table 9 shows the extent to which the different life-cycle groups are represented each year and Table 10 gives the totals during the years 1936—1944 inclusive. There is no reason to deal more closely with all the details listed in the tables, for many of them speak for themselves. But certain summaries and combinations deserve more attention.

First we will consider, on the basis of Tables 9 and 10, the age and life-cycle classes and life-cycle groups which have been *the chief contributors* to the catch. The great majority are ascending for the first time and those five and six years old predominate; those four years of age are next in importance. Among the life-cycle groups A.3 and A.2+ are largest and group A.1+ is the third in order. Among all these age-classes and life-cycle groups the salmon which were three years old when descending to the sea as smolts were most numerous.

The life-cycle group A.3 consisted of 11,075 salmon, or 38·1% of the fish investigated. Of these 9275 salmon or 31·9% of the total were six years old and belonged to the life-cycle class 3·3; they formed the greatest part of group A.3. 1122 salmon of the same age (six years) were returning from their first migration, but belonged to other life-cycle classes, and 172 salmon six years of age had previously spawned. These two groups together make 3·9% of the total. A total of 10,569 salmon were six years old.

Of the salmon examined during the years in question 8357, or 28·8%, belonged to the life-cycle group A.2+; of these 7060 (24·3%) belonged to the life-cycle class 3.2+. Of other five-year-old salmon 1459 were making their first ascent and 51 had previously spawned; together they represent 5·2% of the total. Thus altogether 8570, or 29·5% were five years old.

There were 4882 salmon, or 16·8% belonging to the life-cycle group A.1+; of these 4002 individuals (13·8%) were four-year-olds and belonged to life-cycle class 3.1+. The total number of four-year-olds amounted to 4584, or 15·8%, or not much more than the number of fish belonging to life-cycle class 3.1+. This is due to the fact that few salmon (428 or 1·5%) belong to the life-cycle class 2.1+; and further because salmon which at that young age have already spawned for the first time are extremely rare. There were only five in the total sample.

Of the three groups discussed above A.3 and A.2+ require special attention because of the important part of the catch in Finland during the years 1921—1935 provided by the group A.3. This has led me to use the frequency of this group as a standard of comparison in certain of my surveys (cf. p. 8). According to my investigations this life-cycle group comprised 50·8% of the catch (l. c. p. 41—42); six-year-old individuals formed the majority, or 46·8%, when all life-cycle classes ascending for the first time (as for instance 4.2+) are taken in consideration and 39·7% when only the life-cycle class 3.3 is considered (the difference between the percentages is only 7·1).

As already mentioned Table 11 shows that the group A.3 did not have such a dominant position in the years 1936—1944. The proportions of the life-cycle group A.3 had then diminished to 38·1%, whereas an increase occurred in the two nearest groups A.2+ and A.4 and particularly in group A.1+ (from 10·2% to 16·8%).

Table 9 shows the essential change in the position of the life-cycle group A.3 during the years 1936—1944.

The following relevant figures are extracted from the table:—

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[1]) Salmon fishing in Finland takes place in the summer months, particularly in June and July.

At the Valkeakari fishing ground off Kemi the first salmon is usually caught in large fyke-nets in the last days of May and sometimes not until the beginning of June, as we can see from the notes made by Matti and Eemeli Rantapörhölä:

1919: 27. May 1923: 3. June 1929: 3. June 1937: 17. May
1920: 23. May 1925: 21. May 1930: 16. May 1938: 1. June
1921: 16. May 1926: 28. May 1931: 27. May 1939: 30. May
1922: 24. May 1927: 2. June 1932: 28. May 1940: 12. May

The following observations are from Sarvi fishing ground also off Kemi (notes made by Pekka Dunder:

1934: 28. May 1937: 22. May 1940: 3. June 1943: 26. May
1935: 4. June 1938: 31. May 1941: 14. June 1944: 6. June
1936: 25. May 1939: 25. May 1942: 12. June

Table 4 A. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c. Table 12, p. 40). **Tornio River** (Kiviranta Weir).

Number

Age-Class	Life-Cycle Class	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936—1944
3	2.1+	10	3	9	111	14	5	—	1	17	**170**
	3+	—	—	—	—	—	—	1	—	—	**1**
4	2.2+	4	2	1	2	78	16	44	6	60	**231**
	3.1+	163	55	339	1342	298	109	18	106	359	**2789**
5	2.3	9	2	7	2	20	41	150	73	17	**321**
	3.2+	699	33	61	216	1194	201	595	109	1707	**4815**
	4.1+	54	9	51	189	16	11	4	14	21	**369**
6	2.4	7	—	1	2	1	—	19	40	102	**172**
	3.3	704	91	30	89	410	383	1150	1205	452	**4514**
	4.2+	115	19	4	16	212	22	51	8	43	**490**
	5.1+	—	—	—	2	—	1	—	1	—	**4**
7	2.5	1	—	—	—	—	—	—	—	—	**1**
	3.4	120	29	9	17	69	22	87	145	656	**1154**
	4.3	154	36	9	1	70	27	84	53	8	**442**
	5.2+	2	—	—	—	2	—	—	—	—	**4**
8	3.5	18	2	—	—	2	3	—	1	—	**26**
	4.4	39	12	2	1	5	4	3	6	8	**80**
	5.3	3	2	—	—	1	—	—	—	—	**6**
9	4.5	—	—	—	1	—	—	—	—	—	**1**
	5.4	—	2	—	—	—	—	—	—	—	**2**
	Total ...	**2102**	**297**	**523**	**1991**	**2392**	**845**	**2206**	**1768**	**3450**	**15574**
Previously spawned:											
	once	140	39	14	27	96	52	40	41	36	**485**
	twice	19	5	3	7	9	2	2	3	—	**50**
	four times	—	—	1	—	—	—	—	—	—	**1**
	Total ...	**159**	**44**	**18**	**34**	**105**	**54**	**42**	**44**	**36**	**536**
Life-Cycle Group:											
	A.1+	227	67	399	1644	328	126	23	122	397	**3333**
	A.2+	820	54	66	234	1486	239	690	123	1810	**5522**
	A.3(+)	870	131	46	92	501	451	1384	1331	477	**5283**
	A.4	166	43	12	20	75	26	109	191	766	**1408**
	A.5	19	2	—	1	2	3	—	1	—	**28**
	G	159	44	18	34	105	54	42	44	36	**536**
	Total ...	**2261**	**341**	**541**	**2025**	**2497**	**899**	**2248**	**1812**	**3486**	**16110**

Year	Percentage of group A.3 in total	Year	Percentage of group A.3 in total	Year	Percentage of group A.3 in total
1936	49·1	1939	14·6	1942	60·1
1937	54·1	1940	26·6	1943	72·7
1938	25·2	1941	56·9	1944	14·1

The notable decrease in the importance of group A.3 manifested itself in the years 1938—1940 and 1944. During the last-mentioned years very young, and at the same time small, salmon belonging to the life-cycle group A.1+ increased in numbers: in 1938 they formed 37·2% of the total and in 1939 58·8%. In 1940 A.2+ was the chief group (54·4% of the total) and in 1944 the chief groups were A.2+ (42·4%) and A.4 (33·5%).

Thus the conditions prevailing in the stock of salmon of the Bothnian Bay area during the years 1938—1940 and 1944 were exceptional; they were due on the one hand to the paucity of the year-classes 1931/1932, 1932/1933 and 1937/1938, and on the other hand to the relative abundance of the year-classes 1933/1934, 1934/1935 and 1938/1939. The last-mentioned year-classes gave their share to the catch already at the stages A.1+ and A.2+.

The change in importance of the life-cycle group A.3 may be caused to some extent by the fact that samples from the Tornio River formed the main part

Table 4 B. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c. Table 12, p. 40). **Tornio River** (Kiviranta Weir).

Percentage

Age-Class	Life-Cycle Class	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936–1944
3	2.1+	0·4	0·9	1·7	5·5	0·6	0·6	—	0·1	0·5	1·1
	3+	—	—	—	—	—	—	0·04	—	—	
4	2.2+	0·2	0·6	0·2	0·1	3·1	1·8	1·9	0·3	1·3	**1·3**
	3.1+	7·2	16·1	62·6	66·3	11·9	12·1	0·8	5·8	10·3	**17·3**
5	2.3	0·4	0·6	1·3	0·1	0·8	4·6	6·8	4·0	0·5	**2·0**
	3.2+	30·9	9·7	11·3	10·7	47·8	22·4	26·5	6·0	49·0	**29·9**
	4.1+	2·4	2·6	9·4	9·3	0·6	1·2	0·2	0·8	0·6	**2·3**
6	2.4	0·3	—	0·2	0·1	0·05	—	0·8	2·2	2·9	**1·1**
	3.3	31·2	26·7	5·5	4·4	16·4	42·6	51·1	66·6	13·0	**28·0**
	4.2+	5·1	5·6	0·7	0·8	8·5	2·4	2·3	0·4	1·2	**3·0**
	5.1+	—	—	—	0·1	—	0·1	—	0·1	—	**0·02**
7	2.5	0·1	—	—	—	—	—	—	—	—	**0·01**
	3.4	5·3	8·5	1·7	0·8	2·8	2·4	3·9	8·0	18·9	**7·2**
	4.3	6·8	10·5	1·7	0·04	2·8	3·0	3·7	2·9	0·2	**2·7**
	5.2+	0·1	—	—	—	0·1	—	—	—	—	**0·02**
8	3.5	0·8	0·6	—	—	0·1	0·3	—	0·1	—	**0·2**
	4.4	1·7	3·5	0·4	0·04	0·2	0·5	0·1	0·3	0·2	**0·5**
	5.3	0·1	0·6	—	—	0·05	—	—	—	—	**0·04**
9	4.5	—	—	—	0·04	—	—	—	—	—	**0·01**
	5.4	—	0·6	—	—	—	—	—	—	—	**0·01**
	Total ...	**93·0**	**87·1**	**96·7**	**98·3**	**95·8**	**94·0**	**98·1**	**97·6**	**99·0**	**96·7**
Previously spawned:											
	once	6·2	11·4	2·6	1·3	3·8	5·8	1·8	2·3	1·0	**3·0**
	twice	0·8	1·5	0·5	0·4	0·4	0·2	0·1	0·1	—	**0·3**
	four times	—	—	0·2	—	—	—	—	—	—	**0·01**
	Total ...	**7·0**	**12·9**	**3·3**	**1·7**	**4·2**	**6·0**	**1·9**	**2·4**	**1·0**	**3·3**
Life-Cycle Group:											
	A.1+	10·0	19·6	**73·7**	**81·2**	13·1	14·0	1·0	6·7	11·4	**20·7**
	A.2+	**36·3**	15·9	12·2	11·5	**59·5**	26·6	30·7	6·8	**51·9**	**34·3**
	A.3(+)	**38·5**	**38·4**	8·5	4·5	20·1	**50·2**	**61·6**	**73·5**	13·7	**32·8**
	A.4	7·4	12·6	2·3	1·0	3·0	2·9	4·8	10·5	22·0	**8·7**
	A.5	0·8	0·6	—	0·1	0·1	0·3	—	0·1	—	**0·2**
	G	7·0	12·9	3·3	1·7	4·2	6·0	1·9	2·4	1·0	**3·3**
	Total ...	100	100	100	100	100	100	100	100	100	100

of the material collected during the years 1936—1944. And in the Tornio River the proportion of the group A.2+ since 1930 — when I started my collections — has always been greater than in any other material received. This group formed an absolute majority in 1931, when 56·7% of the salmon examined belonged to it (l. c., p. 40). In other years, viz., 1930, 1932—1935, the share of this group (A.2+) varied in the Tornio River between 23·0 and 42·0%. The life-cycle group A.3, on the other hand, attained in the same material during 1930—1935 a similar percentage only in the year 1934, 37·2%; in all the other years it was smaller.

For some reason unknown to the author the salmon seem to ascend the Tornio River generally at a younger age than elsewhere in Finland. This applies to the years 1936—1944. During these years group A.3 has held a notable position only in 1941, 1942 and 1943 when the percentages were 50·2, 61·6 and 73·5% respectively. In the years 1936 and 1937 the share of this group was 38·5% (cf. table above).

Only one age-class, three-year-old fish of the life-cycle class 2.1+ is younger than those considered above. These fish are on their first return to the river and in 1936—1944 they numbered 429 or only 1·5% of the total.

Next we will deal with the older age-classes, those seven years of age and upwards.

The total number of seven-year-old salmon examined was 3931, or 13·5% of the total. Of these

(Cont. page 26)

Appendix to Table 4

Tornio River.

(l. c., table 12, p. 41).

Previously spawned Salmon divided into Life-Cycle Classes.

Age	Description	Specimens taken per year									Total	Per-
		1936	1937	1938	1939	1940	1941	1942	1943	1944	1936—1944	centage
	Once spawned											
5 years	2.1+G1	—	1	—	—	1	—	—	—	—	2	0·4
	3.1+G+	2	2	—	—	11	—	4	1	9	29	5·4
6 years	2.1+G2	—	—	—	—	—	—	2	—	—	2	0·4
	3.1+G1	1	—	—	5	14	18	8	6	3	55	10·3
	4.1+G+	—	—	—	—	1	—	—	—	—	1	0·2
	2.3G+	—	—	—	—	—	—	—	1	—	1	0·2
	3.2+G+	1	—	—	—	1	—	2	2	3	9	1·7
7 years	3.1+G2	21	2	1	3	4	3	11	2	—	47	8·8
	4.1+G1	—	1	—	1	2	2	—	—	—	6	1·1
	3.2+G1	25	4	—	—	31	13	3	7	4	87	16·2
	4.2+G+	—	1	1	—	—	—	—	—	—	2	0·4
	2.3G1	—	1	—	—	—	2	—	3	1	7	1·3
	3.3G+	6	2	—	3	2	2	7	2	7	31	5·8
	2.4G+	—	—	—	—	—	—	—	1	—	1	0·2
8 years	3.1+G3	—	—	—	—	1	—	—	—	—	1	0·2
	4.1+G2	5	1	—	—	1	—	—	—	—	7	1·3
	3.2+G2	1	—	—	—	—	—	—	—	—	1	0·2
	4.2+G1	5	4	1	2	4	—	1	—	—	17	3·2
	3.3G1	54	10	6	8	18	12	2	15	8	133	24·8
	3.4G+	5	—	—	—	—	—	—	1	—	6	1·1
9 years	4.3G1	7	7	4	4	5	—	—	—	—	27	5·0
	3.4G1	7	3	1	1	—	—	—	—	1	13	2·4
	Total:	140	39	14	27	96	52	40	41	36	485	90·5
	Twice spawned											
6 years	3.1+G+G+	—	—	—	—	—	—	—	1	—	1	0·2
7 years	3.1+G1G+	—	—	—	—	—	—	—	1	—	1	0·2
8 years	3.2+G1G+	2	—	—	—	—	—	1	—	—	3	0·5
	3.3G+G+	—	—	—	—	2	—	—	—	—	2	0·3
9 years	3.2+G1G1	4	1	—	—	5	1	—	—	—	11	2·2
	2.3G1G1	—	—	—	1	—	—	—	1	—	2	0·3
	3.3G1G+	2	—	—	—	—	—	—	—	—	2	0·3
10 years	4.1+G2G1	—	1	—	—	—	—	—	—	—	1	0·2
	4.2+G1G1	1	—	—	—	—	—	—	—	—	1	0·2
	3.3G1G1	8	3	2	5	2	1	1	—	—	22	4·2
11 years	4.3G1G1	1	—	1	1	—	—	—	—	—	3	0·5
	3.4G1G1	1	—	—	—	—	—	—	—	—	1	0·2
	Total:	19	5	3	7	9	2	2	3	0	50	9·3
	Four times spawned											
10 years	5.1+G+G+G+G+	—	1	—	—	—	—	—	—	—	1	0·2
	Grand Total:	159	44	17	34	105	54	42	44	36	536	100·0

Appendix to Table 5 — Kemi, Valkeakari

(l. c., Table 13, partly, p. 44).

Previously spawned Salmon divided into Life-Cycle Classes.

Age	Description	Specimens taken per year										1936—1943	Percentage
		1932	1933	1934	1935	1936	1937	1938	1939	1940	1943		
	Once spawned												
4 years	2.1+G+	—	—	—	—	—	—	—	—	1	—	**1**	**0·3**
5 years	2.1+G1+	—	1	1	—	—	—	1	—	—	—	**1**	**0·3**
	3.1+G+	—	2	1	—	5	—	—	—	1	—	**6**	**1·8**
6 years	2.1+G2	—	1	1	—	1	—	—	—	—	—	**1**	**0·3**
	3.1+G1	1	1	9	5	4	5	2	4	10	—	**25**	**7·3**
	2.2+G1	—	2	1	—	—	—	—	1	1	—	**2**	**0·6**
	3.2+G+	—	—	—	1	—	—	—	1	1	—	**2**	**0·6**
	2.3G+	—	—	1	—	—	1	—	—	1	1	**3**	**0·9**
7 years	3.1+G2	—	2	2	8	8	6	2	—	1	—	**17**	**5·0**
	4.1+G1	1	1	1	1	1	2	—	—	—	—	**3**	**0·9**
	3.2+G1	4	6	11	5	9	10	8	9	7	3	**46**	**13·4**
	4.2+G+	—	1	—	2	1	—	—	—	—	—	**1**	**0·3**
	2.3G1	1	2	2	2	1	—	—	—	1	—	**2**	**0·6**
	3.3G+	6	1	6	2	2	13	1	4	2	3	**25**	**7·3**
8 years	3.1+G3	—	—	—	—	—	—	—	1	—	—	**1**	**0·3**
	4.1+G2	—	1	—	—	2	2	1	—	—	—	**5**	**1·5**
	3.2+G2	—	—	—	1	—	—	—	—	—	—	—	—
	4.2+G1	1	3	1	—	2	6	1	—	—	—	**9**	**2·6**
	3.3G1	14	20	33	15	46	41	24	16	7	6	**140**	**40·9**
	4.3G+	11	—	—	—	—	2	—	—	—	—	**2**	**0·6**
	2.4G1	—	—	2	—	—	—	—	—	—	—	—	—
	3.4G+	—	1	1	—	—	—	—	2	—	—	**2**	**0·6**
9 years	5.1+G2	—	—	—	—	—	1	—	—	—	—	**1**	**0·3**
	4.2+G2	—	—	—	—	1	—	—	—	—	—	**1**	**0·3**
	4.3G1	7	1	5	—	2	10	1	—	—	—	**13**	**3·8**
	3.4G1	2	1	3	1	4	1	3	2	—	—	**10**	**2·9**
	4.4G+	1	1	—	—	—	—	—	—	—	—	—	—
10 years	4.4G1	—	2	—	—	—	—	—	—	—	—	—	—
	Total:	49	50	81	43	89	100	44	40	33	13	**319**	**93·3**
	Twice spawned												
7 years	2.2+G1G+	1	—	—	—	—	—	—	—	—	—	—	—
9 years	3.1+G2G1	—	—	1	—	—	—	—	—	—	—	—	—
	3.2+G1G1	—	—	1	1	1	—	1	1	1	—	**4**	**1·1**
	2.3G1G1	—	1	1	—	—	—	—	—	—	—	—	—
10 years	4.2+G1G1	2	—	—	—	—	1	—	—	—	—	**1**	**0·3**
	3.3G1G1	4	3	3	2	3	4	3	1	—	2	**13**	**3·8**
11 years	4.2+G2G1	—	—	—	—	—	1	—	—	—	—	**1**	**0·3**
	4.3G1G1	—	1	—	—	1	—	—	—	—	—	**1**	**0·3**
	Total:	7	5	6	3	5	6	4	2	1	2	**20**	**5·8**
	Three times spawned												
11 years	4.1+G1G1G1	—	—	—	—	1	—	—	—	—	—	**1**	**0·3**
12 years	3.3G1G1G1	—	—	—	—	—	—	—	—	2	—	**2**	**0·6**
	Grand Total:	**56**	**55**	**87**	**46**	**95**	**106**	**48**	**42**	**36**	**15**	**342**	100·0

In addition Kelts: in 1936 two 3.3G, in 1937 two 3.3G and one 4.3G.

Table 5 A. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c., Table 13, partly, p. 42). **Kemi, Valkeakari** (including Samples from Pensaskari, parish of Alatornio, from the summer of 1943).

Number

Age-Class	Life-Cycle Class	1932	1933	1934	1935	1936	1937	1938	1939	1940	1943	1936–1943
3	2.1+	1	—	4	—	12	31	16	110	12	—	**181**
	3+	—	—	1	—	—	—	—	—	—	—	—
4	2.2+	35	25	15	13	11	9	39	17	46	6	**128**
	3.1+	35	1	110	14	59	57	150	409	67	1	**743**
	4+	—	—	1	—	—	—	—	—	—	—	—
5	2.3	13	205	30	99	61	10	26	47	17	32	**193**
	3.2+	84	587	254	201	220	37	108	392	305	25	**1087**
	4.1+	7	7	42	1	10	7	4	21	3	—	**45**
	5+	—	—	9	—	—	—	—	—	—	—	—
6	2.4	2	6	11	1	8	—	2	5	5	11	**31**
	3.3	271	264	926	498	469	303	112	144	162	143	**1333**
	4.2+	36	71	123	35	44	24	9	11	29	—	**117**
	5.1+	—	1	9	1	—	—	—	—	—	—	—
7	2.5	—	—	2	1	1	—	—	—	—	—	**1**
	3.4	12	27	32	24	60	23	27	10	22	38	**180**
	4.3	142	50	50	84	46	67	19	1	7	1	**141**
	5.2+	1	2	2	—	—	—	—	—	—	—	—
8	3.5	1	2	3	—	—	2	7	—	1	—	**10**
	4.4	8	7	2	2	8	9	3	—	—	—	**20**
	5.3	2	—	—	—	—	2	—	—	—	—	**2**
9	4.5	—	—	—	—	—	2	1	—	—	—	**3**
	5.4	—	—	—	—	—	2	—	—	—	—	**2**
	Total ...	**650**	**1255**	**1626**	**974**	**1009**	**585**	**523**	**1167**	**676**	**257**	**4217**
Previously spawned:												
	once	49	50	81	43	91	103	44	40	33	13	**324**
	twice	7	5	6	3	5	6	4	2	1	2	**20**
	three times	—	—	—	—	1	—	—	—	2	—	**3**
	four times	1	—	—	—	—	—	—	—	—	—	—
	Total ...	**57**	**55**	**87**	**46**	**97**	**109**	**48**	**42**	**36**	**15**	**347**
Life-Cycle Group:												
	A.+	—	—	11	—	—	—	—	—	—	—	—
	A.1+	43	9	165	16	81	95	170	540	82	1	**969**
	A.2+	156	685	394	249	275	70	156	420	380	31	**1333**
	A.3	428	519	1006	681	576	382	157	192	186	176	**1661**
	A.4	22	40	45	27	76	34	32	15	27	49	**233**
	A.5	1	2	5	1	1	4	8	—	1	—	**14**
	G	57	55	87	46	97	109	48	42	36	15	**347**
	Total ...	**707**	**1310**	**1713**	**1020**	**1106**	**694**	**571**	**1209**	**712**	**272**	**4564**

Table 5 B. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c., Table 13, partly, p. 43). **Kemi, Valkeakari** (including Samples from Pensaskari, parish of Alatornio, from the summer of 1943).

Percentage

Age-Class	Life-Cycle Class	1932	1933	1934	1935	1936	1937	1938	1939	1940	1943	1936–1943
3	2.1+	0·1	—	0·2	—	1·1	4·5	2·8	9·1	1·7	—	**4·0**
	3+	—	—	0·05	—	—	—	—	—	—	—	—
4	2.2+	5·0	1·0	0·9	1·3	1·0	1·3	6·8	1·4	6·5	2·2	**2·8**
	3.1+	5·0	0·1	6·4	1·4	5·3	8·2	26·3	33·8	9·4	0·4	**16·3**
	4+	—	—	0·05	—	—	—	—	—	—	—	—
5	2.3	1·8	15·6	1·8	9·7	5·5	1·4	4·6	3·9	2·4	11·7	**4·2**
	3.2+	11·9	44·8	14·8	19·7	19·9	5·3	18·9	32·5	42·8	9·2	**23·8**
	4.1+	1·0	0·5	2·5	0·1	0·9	1·0	0·7	1·7	0·4	—	**1·0**
	5+	—	—	0·5	—	—	—	—	—	—	—	—
6	2.4	0·3	0·5	0·6	0·1	0·7	—	0·4	0·4	0·7	4·0	**0·7**
	3.3	38·3	20·1	54·0	48·8	42·4	43·7	19·6	11·9	22·8	52·6	**29·2**
	4.2+	5·1	5·4	7·2	3·4	4·0	3·4	1·6	0·9	4·1	—	**2·6**
	5.1+	—	0·1	0·5	0·1	—	—	—	—	—	—	—
7	2.5	—	—	0·1	0·1	0·1	—	—	—	—	—	—
	3.4	1·7	2·1	1·9	2·4	5·4	3·3	4·7	0·8	3·1	14·0	**3·9**
	4.3	20·1	3·8	2·9	8·2	4·2	9·7	3·3	0·1	1·0	0·4	**3·1**
	5.2+	0·1	0·2	0·1	—	—	—	—	—	—	—	—
8	3.5	0·1	0·2	0·2	—	—	0·3	1·2	—	0·1	—	**0·2**
	4.4	1·1	0·5	0·1	0·2	0·7	1·3	0·5	—	—	—	**0·4**
	5.3	0·3	—	—	—	—	0·3	—	—	—	—	**0·04**
9	4.5	—	—	—	—	—	0·3	0·2	—	—	—	**0·1**
	5.4	—	—	—	—	—	0·3	—	—	—	—	**0·04**
	Total ...	**91·9**	**95·8**	**94·9**	**95·5**	**91·2**	**84·3**	**91·6**	**96·5**	**95·0**	**94·5**	**92·4**
Previously spawned:												
	once	7·0	3·8	4·7	4·2	8·2	14·8	7·7	3·3	4·6	4·8	**7·1**
	twice	1·0	0·4	0·4	0·3	0·5	0·9	0·7	0·2	0·1	0·7	**0·4**
	three times	—	—	—	—	0·1	—	—	—	0·3	—	**0·1**
	four times	0·1	—	—	—	—	—	—	—	—	—	—
	Total ...	**8·1**	**4·2**	**5·1**	**4·5**	**8·8**	**15·7**	**8·4**	**3·5**	**5·0**	**5·5**	**7·6**
Life-Cycle Group:												
	A.+	—	—	0·6	—	—	—	—	—	—	—	—
	A.1+	6·1	0·7	9·6	1·6	7·3	13·7	**29·8**	**44·7**	11·5	0·4	**21·3**
	A.2+	22·1	**52·3**	23·0	24·4	24·8	10·2	**27·3**	**34·7**	**53·4**	11·4	**29·2**
	A.3	**60·5**	39·6	**58·8**	**66·8**	**52·1**	**55·3**	**27·5**	15·9	26·1	**64·7**	**36·5**
	A.4	3·1	3·1	2·6	2·6	6·9	4·9	5·6	1·2	3·8	18·0	**5·1**
	A.5	0·1	0·1	0·3	0·1	0·1	0·6	1·4	—	0·2	—	**0·3**
	G	8·1	4.2	5·5	4·5	8·8	15·3	8·4	3·5	5·0	5·5	**7·6**
	Total ...	100	100	100	100	100	100	100	100	100	100	100

Table 6 A. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c., Table 13, partly, p. 42). **Kemi River** (The weirs of Köngäs, parish of Tervola and Muurola, parish of Rovaniemi.)

Number

Age-Class	Life-Cycle Class	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936—1944
3	2.1+	—	—	—	1	—	—	—	23	—	—	—	—	2	**25**
4	2.2+	4	5	4	2	3	2	23	12	26	10	—	—	14	**90**
	3.1+	—	2	—	—	—	—	19	89	—	—	—	—	7	**115**
5	2.3	3	22	6	43	4	1	9	31	9	19	17	21	3	**114**
	3.2+	15	120	62	91	99	16	92	144	177	13	15	4	59	**619**
	4.1+	—	—	—	1	—	—	—	7	—	—	—	—	—	**7**
6	2.4	—	2	5	2	3	—	—	—	—	3	7	16	19	**48**
	3.3	34	35	587	333	163	83	101	113	132	235	204	290	57	**1378**
	4.2+	7	5	42	43	24	10	5	5	21	3	4	—	5	**77**
7	3.4	6	5	9	22	33	6	47	9	13	28	13	67	117	**333**
	4.3	8	11	28	103	25	6	24	—	2	2	15	2	5	**81**
	5.2+	—	—	—	3	—	—	—	—	—	—	—	—	—	—
8	3.5	—	—	—	—	2	2	—	1	1	2	—	—	—	**8**
	4.4	—	—	4	1	7	2	3	—	—	1	1	—	—	**14**
	5.3	—	—	—	1	—	3	—	—	—	—	—	—	—	**3**
9	4.5	—	—	—	—	—	1	—	—	—	—	—	—	—	**1**
	Total ...	**77**	**207**	**787**	**646**	**363**	**132**	**323**	**434**	**381**	**316**	**276**	**400**	**288**	**2913**
Previously spawned:															
	once:	3	6	35	25	53	10	35	26	24	35	14	11	8	**216**
	twice	1	2	3	3	2	1	2	1	2	1	1	1	1	**12**
	three times	—	—	1	1	—	1	—	—	—	—	—	—	—	**1**
	Total ...	**4**	**8**	**39**	**29**	**55**	**12**	**37**	**27**	**26**	**36**	**15**	**12**	**9**	**229**
Life-Cycle Group:															
	A.1+	—	2	—	2	—	—	19	119	—	—	—	—	9	**147**
	A.2+	26	130	108	139	126	28	120	161	224	26	19	4	78	**786**
	A.3(+)	45	68	621	480	192	93	134	144	143	256	236	313	65	**1576**
	A.4	6	7	18	25	43	8	50	9	13	32	21	83	136	**395**
	A.5	—	—	—	—	2	3	—	1	1	2	—	—	—	**9**
	G	4	8	39	29	55	12	37	27	26	36	15	12	9	**229**
	Total ...	**81**	**215**	**786**	**675**	**418**	**144**	**360**	**461**	**407**	**352**	**291**	**412**	**297**	**3142**
	Catch ...					**424**	**212**	**421**	**461**	**464**	**784**	**704**	—	**613**	

2707 (or 9·3% of the total) belonged to the life-cycle class 3·4. The total in the life-cycle group A.4 was 3243 or 11·2%. In the total 430, or 1·5%, were making their second ascent; two of the salmon of this age had already ascended twice and thus were making their third ascent when caught.

The majority of eight-year-old salmon were fish which had previously spawned: they numbered 533, which represents only 1·8% of the total. Most of these, i. e. 523, were making their second ascent, only 10 were on their third ascent. The majority (130 or 0·5% of the total catch) of those which were just finishing their first migration belonged to the life-cycle class 4.4. Life-cycle class 3.5 is represented by 99 fish or 0·3%. Group A.5 is represented by 120 fish or 0·4%. The total number of eight-year-old salmon examined is 774 or 2·7%.

The number of nine-year-old salmon is small — only 133 fish or 0·4%: only 11, or 0·03%, were returning from their first migration — they belong to the life-cycle classes 4.5 and 5.4. Of the others 96 salmon were making their second ascent, and 26 their third ascent, the total number being 126 or 0·4%.

Salmon which reach the age of ten years are very rare, only 57 or 0·2%, of these 56 had spawned twice and one belonged to the life-cycle class 5.1+G+G+G+G+. The last fish had spawned first as a grilse and then in each subsequent autumn; it was a male.

Salmon which had reached the age of eleven and twelve years were the oldest individuals examined during the years 1936—1944. There were 10 eleven-year-old salmon and 4 twelve-year-olds; together they do not represent more than 0·04% of the total catch.

(Cont. page 28)

Table 6 B. **Division of Salmon into Life-Cycle Classes** **Kemi River**

according to Scale Samples (l. c., Table 13, partly, p. 43).

(The weirs of Köngäs, parish of Tervola, and Muurola, parish of Rovaniemi.)

Percentage

Age-Class	Life-Cycle Class	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936—1944
3	2.1+	—	—	—	0·1	—	—	—	5·0	—	—	—	—	0·7	**0·8**
4	2.2+	4·9	2·3	0·5	0·3	0·7	1·4	6·4	2·6	6·4	2·8	—	—	4·7	**2·9**
	3.1+	—	0·9	—	—	—	—	5·3	19·3	—	—	—	—	2·3	**3·7**
5	2.3	3·7	10·3	0·8	6·4	0·9	0·7	2·5	6·7	2·2	5·4	5·8	5·1	1·0	**3·6**
	3.2+	18·5	55·9	7·9	13·5	23·7	11·1	25·6	31·2	43·5	3·7	5·2	1·0	19·9	**19·7**
	4.1+	—	—	—	0·1	—	—	—	1·5	—	—	—	—	—	—
6	2.4	—	0·9	0·6	0·3	0·7	—	—	—	—	0·8	2·4	3·9	6·4	**1·5**
	3.3	42·1	16·3	74·7	49·4	39·0	57·6	28·0	24·5	32·4	66·8	70·1	70·4	19·2	**43·9**
	4.2+	8·6	2·3	5·3	6·4	5·7	6·9	1·4	1·1	5·2	0·8	1·4	—	1·7	**2·5**
7	3.4	7·4	2·3	1·1	3·3	7·9	4·2	13·0	2·0	3·2	8·0	4·4	16·3	39·4	**10·6**
	4.3	9·9	5·1	3·6	15·3	6·0	4·2	6·7	—	0·5	0·6	5·2	0·5	1·7	**2·6**
	5.2+	—	—	—	0·4	—	—	—	—	—	—	—	—	—	—
8	3.5	—	—	—	—	0·5	1·4	—	0·2	0·2	0·6	—	—	—	**0·3**
	4.4	—	—	0·5	0·1	1·7	1·4	0·8	—	—	0·3	0·3	—	—	**0·4**
	5.3	—	—	—	0·1	—	2·1	—	—	—	—	—	—	—	**0·1**
9	4·5	—	—	—	—	—	0·7	—	—	—	—	—	—	—	**0·04**
	Total ...	**95·1**	**96·3**	**95·0**	**95·7**	**86·8**	**91·7**	**89·7**	**94·1**	**93·6**	**89·8**	**94·8**	**97·2**	**97·0**	**92·64**
Previously spawned:															
	once:	3·7	2·8	4·5	3·8	12·7	6·9	9·7	5·7	5·9	9·9	4·9	2·7	2·7	**6·9**
	twice	1·2	0·9	0·4	0·4	0·5	0·7	0·6	0·2	0·5	0·3	0·3	0·1	0·3	**0·4**
	three times	—	—	0·1	0·1	—	0·7	—	—	—	—	—	—	—	**0·04**
	Total ...	**4·9**	**3·7**	**5·0**	**4·3**	**13·2**	**8·3**	**10·3**	**5·9**	**6·4**	**10·2**	**5·2**	**2·8**	**3·0**	**7·34**
Life-Cycle Group:															
	A.1+	—	0·9	—	0·3	—	—	5·3	**25·8**	—	—	—	—	3·0	**4·7**
	A.2+	32·1	**60·5**	13·7	20·6	**30·1**	19·4	**33·4**	**34·9**	**55·0**	7·4	6·5	1·0	26·3	**25·0**
	A.3(+)	**55·6**	31·6	**79·0**	**71·1**	**45·9**	**64·6**	**37·2**	**31·2**	**35·0**	**72·7**	**81·1**	**76·0**	21·9	**50·1**
	A.4	7·4	3·3	2·3	3·7	10·3	5·6	13·8	2·0	3·2	9·1	7·2	20·1	**45·8**	**12·6**
	A.5	—	—	—	—	0·5	2·1	—	0·2	0·2	0·6	—	—	—	**0·3**
	G	4·9	3·7	5·0	4·3	13·2	8·3	10·3	5·9	6·4	10·2	5·2	2·9	3·0	**7·3**
	Total ...	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 7. Division of Salmon into Life-Cycle Classes

according to Scale Samples.

Ii and Simoniemi.

Ii (Sea)

1942: **86** Ind.
- A.1+: 0
- A.2+: 2.2+: 4, 3.2+: 32, 4.2+: 1. Total: 37 (43·0 %)
- A.3: 2.3: 5, 3.3: 40. Total: 45 (52·3 %)
- A.4: 2.4: 2, 3.4: 2. Total: 4 (4·7 %)
- G: 0

1944: **69** Ind.
- A.1+: 0
- A.2+: 2.2+: 2, 3.2+: 7. Total: 9 (13·0 %)
- A.3: 2.3: 2, 3.3: 15. Total: 17 (24·6 %)
- A.4: 2.4: 4, 3.4: 39. Total: 43 (62·4 %)
- G: 0

Simoniemi, Montaja (Sea).

1943: **325** Ind.
- A.1+: 3.1+: 4 (1·3 %), 4.1+: 2 (0·6 %). Total: 6 (1·9 %)
- A.2+: 2.2+: 2 (0·6 %), 3.2+: 17 (5·2 %), Total: 19 (5·8 %)
- A.3: 2.3: 14 (4·2 %), 3.3: 239 (73·8 %), 4.3: 7 (2·0 %), Total: 260 (80·0 %)
- A.4: 2.4: 10 (3·1 %), 3.4: 28 (8·6 %), Total: 38 (11·7 %)
- G: 3.2+G1: 1 (0·3 %), 3.3G1: 1 (0·3 %).

Appendix to Table 6

(l. c., Table 13, partly, p. 44).

Kemi River
(Köngäs and Muurola).

Previously spawned Salmon divided into Life-Cycle Classes.

Age	Description	Specimens taken per year														
		1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936—1944	Per-centage
	Once spawned															
4 years	2.1+G+	—	—	—	—	—	—	—	—	—	—	—	—	1	**1**	**0·4**
5 years	2.1+G1	—	—	—	—	—	—	—	1	1	1	—	—	—	**3**	**1·3**
	3.1+G+	—	—	—	—	—	—	—	1	—	—	—	—	—	**1**	**0·4**
6 years	3.1+G1	—	1	3	1	—	—	6	1	7	7	—	—	—	**21**	**9·2**
	2.1+G2	—	—	—	—	—	—	—	—	—	—	—	1	—	**1**	**0·4**
	2.2+G1	—	—	1	—	—	1	—	1	—	—	4	—	—	**6**	**2·6**
	3.2+G+	—	—	—	—	—	—	1	1	—	3	—	2	—	**7**	**3·1**
	2.3G+	—	—	—	—	1	—	—	—	—	—	—	—	—	**1**	**0·4**
7 years	3.1+G2	—	—	2	2	1	—	1	1	—	—	1	1	—	**5**	**2·2**
	3.2+G1	—	2	2	11	4	1	9	6	9	13	3	3	—	**48**	**21·0**
	2.3G1	—	1	—	1	1	—	1	—	—	2	—	2	1	**7**	**3·1**
	3.3G+	—	1	2	1	3	—	—	6	2	—	2	—	2	**15**	**6·6**
8 years	3.2+G2	—	—	—	2	—	—	1	—	—	—	—	—	—	**1**	**0·4**
	4.2+G1	—	—	—	2	1	1	1	—	—	1	—	1	—	**5**	**2·2**
	3.3G1	2	1	18	4	39	7	9	7	5	8	4	1	4	**84**	**36·8**
	2.4G1	—	—	1	—	1	—	1	—	—	—	—	—	—	**2**	**0·9**
	3.4G+	—	—	—	—	—	—	1	—	—	—	—	—	—	**1**	**0·4**
	5.2+G1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
9 years	4.3G1	—	—	4	1	—	—	1	—	—	—	—	—	—	**1**	**0·4**
	3.4G1	1	—	—	—	2	—	3	1	—	—	—	—	—	**6**	**2·6**
	Total:	3	6	35	25	53	10	35	26	24	35	14	11	8	**216**	**94·4**
	Twice spawned															
7 years	3.2+G+G+	—	—	—	—	1	—	—	—	—	—	—	—	—	**1**	**0·4**
8 years	2.2+G1G1	—	—	—	1	—	—	—	—	—	—	—	1	—	**1**	**0·4**
	3.3G+G+	—	—	—	1	—	—	—	1	—	—	—	—	1	**2**	**0·9**
9 years	3.2+G1G1	—	—	—	—	—	—	1	—	1	—	—	—	—	**2**	**0·9**
	2.3G1G1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
10 years	3.3G1G1	1	1	2	1	1	1	1	—	—	1	1	—	—	**5**	**2·2**
11 years	4.3G1G1	—	1	—	—	—	—	—	—	1	—	—	—	—	**1**	**0·4**
	Total:	1	2	3	3	2	1	2	1	2	1	1	1	1	**12**	**5·2**
	Three times spawned															
12 years	3.3G1G1G1	—	—	1	1	—	1	—	—	—	—	—	—	—	**1**	**0·4**
	Grand Total:	**4**	**8**	**39**	**29**	**55**	**12**	**37**	**27**	**26**	**36**	**15**	**12**	**9**	**229**	100·0

The number of salmon in each life-cycle class which have previously ascended and spawned is given in the appendix to Table 10, in which also the proportion between the number of spawned salmon belonging to the different life-cycle classes is presented in percentages.

On the basis of this table two other combinations will be dealt with, in which, however, the total number of salmon investigated will be taken as the basis for comparison. In this case the comparison will be made in thousands of individuals (per mille figures). The first combination presents the life-cycle classes arranged according to their individual number, the second omitting the smolt-age.

Appendix to Table 8

Oulu River.

(l. c., Table 14, p. 48).

Previously spawned Salmon divided into Life-Cycle Classes.

Age	Description	Specimens taken per year									1936–1944	Percentage
		1936	1937	1938	1939	1940	1941	1942	1943	1944		
	Once spawned											
4 years	2.1+G+	—	—	2	—	1	—	—	—	—	3	1·1
5 years	2.1+G1	—	—	—	—	1	—	1	—	—	2	0·7
	3.1+G+	4	—	2	1	—	—	—	—	—	7	2·6
6 years	2.1+G2	1	—	—	—	1	—	—	—	—	2	0·7
	3.1+G1	9	3	2	1	3	5	1	1	1	26	9·7
	4.1+G+	1	—	—	—	—	—	—	—	—	1	0·4
	2.2+G1	1	1	1	1	—	—	—	—	1	5	1·9
7 years	3.1+G2	12	3	8	—	2	—	3	1	—	29	10·9
	4.1+G1	—	1	—	—	—	—	—	—	—	1	0·4
	3.2+G1	1	9	2	2	1	5	—	1	2	23	8·6
	2.3G1	1	2	1	2	—	—	5	—	1	12	4·5
	3.3G+	4	—	—	—	—	1	—	2	—	7	2·6
	2.4G+	—	—	—	—	—	1	—	—	—	1	0·4
8 years	4.1+G2	1	2	—	—	—	—	—	—	—	3	1·1
	3.2+G2	2	—	1	—	—	—	—	—	—	3	1·1
	3.3G1	26	14	17	6	3	7	9	1	10	93	34·8
	2.4G1	1	—	1	—	—	—	—	—	—	2	0·7
	3.4G+	1	—	—	—	—	—	—	—	1	2	0·7
9 years	4.3G1	1	—	1	—	—	1	—	—	—	3	1·1
	3.4G1	8	1	3	1	1	5	2	—	—	21	7·8
	Total:	74	36	41	14	13	25	21	6	16	246	91·8
	Twice spawned											
8 years	3.2+G1G+	—	—	—	—	—	1	—	—	—	1	0·4
	2.3G1G+	—	—	—	—	—	1	—	—	—	1	0·4
9 years	3.2+G1G1	1	—	1	—	—	—	—	—	—	2	0·7
	2.3G1G1	—	1	—	—	—	—	1	—	—	2	0·7
10 years	3.3G1G1	3	—	4	—	3	1	1	—	—	12	4·5
	2.4G1G1	—	—	—	1	—	—	—	—	—	1	0·4
11 years	3.4G1G1	—	—	—	1	—	—	—	—	—	1	0·4
	Total:	4	1	5	2	3	3	2	0	0	20	7·5
	Three Times spawned											
11 years	3.2+G1G1G1	—	—	—	—	—	1	—	—	—	1	0·4
12 years	3.3G1G1G1	—	—	—	—	—	1	—	—	—	1	0·3
	Grand Total:	78	37	46	16	16	30	23	6	16	268	100·0

In addition Kelts: one 3.3G and one 3.G1G in 1936.

Table 8 A. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c., Table 14, p. 46). **Oulu River** (mostly from Pyhäkoski Rapids, but since 1941 from the Merikoski Rapids).

Age-Class	Life-Cycle Class	Number 1936	1937	1938	1939	1940	1941	1942	1943	1944	1936–1944
3	2.1+	8	2	29	10	3	—	—	—	—	**52**
4	2.2+	34	6	17	23	4	4	31	9	10	**138**
	3.1+	63	15	138	124	11	—	—	—	—	**351**
5	2.3	147	51	23	37	39	18	32	7	9	**363**
	3.2+	95	28	76	84	38	6	92	34	30	**483**
	4.1+	1	3	16	4	—	—	—	—	—	**24**
6	2.4	38	14	7	2	1	6	6	11	50	**135**
	3.3	754	216	155	136	166	79	73	97	80	**1756**
	4.2+	9	1	13	3	3	—	—	1	1	**31**
7	2.5	2	5	2	—	1	—	—	1	1	**12**
	3.4	172	78	62	6	18	17	60	16	542	**971**
	4.3	36	42	7	5	10	2	—	—	3	**105**
8	3.5	16	15	10	5	—	3	3	1	2	**55**
	4.4	7	1	—	—	1	1	1	—	5	**16**
	5.3	—	1	—	—	—	—	—	—	—	**1**
9	3.6	—	1	—	—	—	—	—	—	—	**1**
	4.5	—	1	—	—	—	—	—	—	—	**1**
	Total ...	**1382**	**480**	**555**	**439**	**295**	**136**	**298**	**177**	**733**	**4495**
Previously spawned:											
	once	76[1])	36	41	14	13	25	21	6	16	**248**
	twice	4	1	5	2	3	3	2	—	—	**20**
	three times	—	—	—	—	—	2	—	—	—	**2**
	Total ...	**80**	**37**	**46**	**16**	**16**	**30**	**23**	**6**	**16**	**270**
Life-Cycle Group:											
	A.1+	72	20	183	138	14	—	—	—	—	**427**
	A.2+	138	35	106	110	45	10	123	44	41	**652**
	A.3(+)	937	310	185	178	215	99	105	104	92	**2225**
	A.4	217	93	69	8	20	24	67	27	597	**1122**
	A.5	18	22[2])	12	5	1	3	3	2	3	**69**
	G	80	37	46	16	16	30	23	6	16	**270**
	Total ...	**1462**	**517**	**601**	**455**	**311**	**166**	**321**	**183**	**749**	**4765**

[1]) Two specimen were kelts. [2]) One 3·6 is added.

Combination A.

1. Life-cycle classes which had spawned once and were on their second ascent:

	Number	Per mille		Number	Per mille		Number	Per mille		Number	Per mille
3·3 G 1	451	15·52	3.1+G+	43	1·48	4.1+G 1	10	0·34	4.2+G+	3	0·10
3·2+G 1	205	7·05	4.2+G 1	31	1·07	2.1+G 1	8	0·28	4.1+G+	2	0·07
3.1+G 1	127	4·37	2.3 G 1	28	0·96	2.1+G 2	6	0·21	2.4 G+	2	0·07
3.1+G 2	98	3·37	3.2+G+	18	0·62	2.1+G+	5	0·17	3.1+G 3	2	0·07
3.3 G+	78	2·68	4.1+G 2	15	0·52	2.3 G+	5	0·17	4.3 G+	2	0·07
3.4 G 1	50	1·72	2.2+G 1	13	0·45	3.2+G 2	5	0·17	5.1+G 2	1	0·03
4.3 G 1	44	1·51	3.4 G+	11	0·38	2.4 G 1	4	0·14	4.2+G 2	1	0·03

Total 1268 or 43·63 per mille.

Table 8 B. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c., Table 14, p. 47). **Oulu River** (mostly from Pyhäkoski Rapids, but since 1941 from the Merikoski Rapids).

Age-Class	Life-Cycle Class	Percentage									
		1936	1937	1938	1939	1940	1941	1942	1943	1944	1936—1944
3	2.1+	0·5	0·4	4·8	2·2	1·0	—	—	—	—	**1·1**
4	2.2+	2·3	1·1	2·8	5·1	1·3	2·4	9·6	4·9	1·3	**2·9**
	3.1+	4·3	2·9	23·0	27·3	3·5	—	—	—	—	**7·4**
5	2.3	10·0	9·9	3·8	8·1	12·5	10·9	10·0	3·8	1·2	**7·6**
	3.2+	6·5	5·4	12·6	18·5	12·2	3·6	28·7	18·6	3·9	**10·1**
	4.1+	0·1	0·6	2·7	0·9	—	—	—	—	—	**0·5**
6	2.4	2·6	2·7	1·2	0·4	0·3	3·6	1·9	6·0	6·7	**2·8**
	3.3	51·6	41·8	25·8	29·9	53·4	47·6	22·7	53·0	10·7	**36·9**
	4.2+	0·6	0·2	2·1	0·6	1·0	—	—	0·5	0·1	**0·7**
7	2.5	0·1	0·9	0·3	—	0·3	—	—	0·5	0·1	**0·2**
	3.4	11·8	15·1	10·3	1·3	5·8	10·2	18·7	8·7	72·5	**20·4**
	4.3	2·5	8·1	1·2	1·1	3·2	1·2	—	—	0·4	**2·2**
8	3.5	1·1	2·9	1·7	1·1	—	1·8	0·9	0·6	0·5	**1·1**
	4.4	0·5	0·2	—	—	0·3	0·6	0·3	—	0·7	**0·3**
	5.3	—	0·2	—	—	—	—	—	—	—	**0·02**
9	3.6	—	0·2	—	—	—	—	—	—	—	**0·02**
	4.5	—	0·2	—	—	—	—	—	—	—	**0·02**
	Total ...	**94·5**	**92·8**	**92·3**	**96·5**	**94·8**	**81·9**	**92·8**	**96·7**	**97·9**	**94·3**
Previously spawned:											
	once	5·2	7·0	6·9	3·1	4·2	15·1	6·6	3·3	2·1	**5·26**
	twice	0·3	0·2	0·8	0·4	1·0	1·8	0·6	—	—	**0·4**
	three times	—	—	—	—	—	1·2	—	—	—	**0·04**
	Total ...	**5·5**	**7·2**	**7·7**	**3·5**	**5·2**	**18·1**	**7·2**	**3·3**	**2·1**	**5·7**
Life-Cycle Group:											
	A.1+	4·9	3·9	**30·4**	**30·3**	4·5	—	—	—	—	**9·0**
	A.2+	9·4	6·7	17·6	24·2	14·5	6·0	**38·3**	24·0	5·5	**13·7**
	A.3(+)	**64·1**	**60·0**	**30·8**	**39·1**	**69·1**	**59·6**	**32·7**	**56·8**	12·3	**46·7**	
	A.4	14·9	18·0	11·5	1·8	6·4	14·5	20·9	14·8	**79·7**	**23·5**
	A.5	1·2	4·2	2·0	1·1	0·3	1·8	0·9	1·1	0·4	**1·4**
	G	5·5	7·2	7·7	3·5	5·2	18·1	7·2	3·3	2·1	**5·7**
	Total ...	100	100	100	100	100	100	100	100	100	100

2. Life-cycle classes which had spawned twice and were on their third ascent:

	Number	Per mille		Number	Per mille
3.3 G 1 G 1	52	1·79	3.1+G+ G+	1	0·03
3.2+G 1 G 1	19	0·65	3.1+G 1 G+	1	0·03
4.3 G 1 G 1	5	0·17	3.2+G+ G+	1	0·03
3.2+G 1 G 1	4	0·14	2.2+G 1 G 1	1	0·03
3.3 G+ G+	4	0·14	2.3 G 1 G+	1	0·03
2.3 G 1 G 1	4	0·14	4.1+G 2 G 1	1	0·03
3.3 G 1 G+	2	0·07	2.4 G 1 G 1	1	0·03
4.2+G 1 G 1	2	0·07	4.2+G 2 G 1	1	0·03
3.4 G 1 G 1	2	0·07			

Total 102 or 3·51 per mille.

3. Life-cycle classes which had spawned three times and were on their fourth ascent:

	Number	Per mille		Number	Per mille
3.3 G1G1G1	4	0·14	3.2+G1G1G1	1	0·03
4.1+G1G1G1	1	0·03			

Total 6 or 0·21 per mille.

4. One fish which had spawned four times (per mille 0.03).

5. 1+G+G+G+G+

(Cont. page 33)

Table 9.

Division of Salmon into Life-Cycle Groups 1936—1944

according to Scale Samples (Number and Percentage).

Years	Life-Cycle Groups	Tornio River	Kemi Valkeakari etc.	Kemi River	Oulu River	Total	Percentage
1936	A.1+	227	81	—	72	**380**	7·2
	A.2+	820	275	126	138	**1359**	25·9
	A.3	870	576	192	937	**2575**	**49·1**
	A.4	166	76	43	217	**505**	9·6
	A.5	19	1	2	18	**40**	0·8
	G	159	97	55	80	**391**	7·4
	Total	**2261**	**1106**	**418**	**1462**	**5247**	100·0
1937	A.1+	67	95	—	20	**182**	10·8
	A.2+	54	70	28	35	**187**	11·0
	A.3	131	382	93	310	**916**	**54·1**
	A.4	43	34	8	93	**178**	10·5
	A.5	2	4	3	22[1])	**31**	1·8
	G	44	109	12	37	**199**	11·8
	Total	**341**	**694**	**144**	**517**	**1693**	100·0
1938	A.1+	399	170	19	183	**771**	**37·2**
	A.2+	66	156	120	106	**448**	21·6
	A.3	46	157	134	185	**522**	25·2
	A.4	12	32	50	69	**163**	7·9
	A.5	—	8	—	12	**20**	0·9
	G	18	48	37	46	**149**	7·2
	Total	**541**	**571**	**360**	**601**	**2073**	100·0
1939	A.1+	1644	540	119	138	**2441**	**58·8**
	A.2+	234	420	161	110	**925**	22·3
	A.3	92	192	144	178	**606**	14·6
	A.4	20	15	9	8	**52**	1·2
	A.5	1	—	1	5	**7**	0·2
	G	34	42	27	16	**119**	2·9
	Total	**2025**	**1209**	**461**	**455**	**4150**	100·0
1940	A.1+	328	82	—	14	**424**	10·8
	A.2+	1486	380	224	45	**2135**	**54·4**
	A.3	501	186	143	215	**1045**	26·6
	A.4	75	27	13	20	**135**	3·4
	A.5	2	1	1	1	**5**	0·1
	G	105	36	26	16	**183**	4·7
	Total	**2497**	**712**	**407**	**311**	**3927**	100·0

[1]) One specimen represents the Life-Cycle-Class 3·6 (also the Group A.6).

Table 9 (continued).

Years	Life-Cycle Groups	Tornio River	Kemi Valkeakari etc.	Kemi River	Oulu River	Total	Percentage
1941	A.1+	126	—	—	—	**126**	8·9
	A.2+	239	—	26	10	**275**	19·4
	A.3	451	—	256	99	**806**	**56·9**
	A.4	26	—	32	24	**82**	5·8
	A.5	3	—	2	3	**8**	0·5
	G	54	—	36	30	**120**	8·5
	Total	**899**	—	**352**	**166**	**1417**	100·0
1942	A.1+	23	—	—	—	**23**	0·6
	A.2+	690	37	19	123	**869**	29·5
	A.3	1384	45	236	105	**1770**	**60·1**
	A.4	109	4	21	67	**201**	7·0
	A.5	—	—	—	3	**3**	0·1
	G	42	—	15	23	**80**	2·7
	Total	**2248**	**86**	**291**	**321**	**2946**	100·0
1943	A.1+	122	7	—	—	**129**	4·3
	A.2+	123	50	4	44	**221**	7·4
	A.3	1331	436	313	104	**2184**	**72·7**
	A.4	191	87	83	27	**388**	12·9
	A.5	1	—	—	2	**3**	0·1
	G	44	17	12	6	**79**	2·6
	Total	**1812**	**597**	**412**	**183**	**3004**	100·0
1944	A.1+	397	—	9	—	**406**	8·8
	A.2+	1810	9	78	41	**1938**	**42·2**
	A.3	477	17	65	92	**651**	14·1
	A.4	766	43	136	597	**1542**	**33·5**
	A.5	—	—	—	3	**3**	0·1
	G	36	—	9	16	**61**	1·3
	Total	**3486**	**69**	**297**	**749**	**4601**	100·0
Grand Total: **1936—1944**	A.1+	3333	975	147	427	**4882**	16·8
	A.2+	5522	1397	786	652	**8357**	**28·8**
	A.3	5283	1991	1576	2225	**11075**	**38·1**
	A.4	1408	318	395	1122	**3243**	11·2
	A.5	28	14	9	69[1])	**120**	0·4
	G	536	349	229	270	**1384**	4·7
	Total	**16110**	**5044**	**3142**	**4765**	**29061**	100·0
	Percentage	55·4	17·4	10·8	16·4	100·0	

Table 10.

Division of Salmon into Age-Classes 1936—1944

according to Scale Samples (Number and Percentage).

Age-Classes	Life-Cycle Classes	Tornio River	Kemi Valkeakari etc.	Kemi River	Oulu River	Total	Percentage
3	2.1+	170	181	25	52	**428**	**1·5**
	3.+	1	—	—	—	**1**	0·003
	Total	**171**	**181**	**25**	**52**	**429**	**1·5**
4	2.2+	213	136	90	138	**577**	**2·0**
	3.1+	2789	747	115	351	**4002**	**13·8**
	G(1×) ...	—	1	1	3	**5**	0·02
	Total	**3002**	**884**	**206**	**492**	**4584**	**15·8**
	A.1+....	3333	975	147	427	4882	16·8
5	2.3	321	214	114	363	**1012**	**3·5**
	3.2+	4815	1143	619	483	**7060**	**24·3**
	4.1+	369	47	7	24	**447**	**1·5**
	G(1×) ...	31	7	4	9	**51**	0·2
	Total	**5536**	**1411**	**744**	**879**	**8570**	**29·5**
	A.2+....	5522	1397	786	652	8357	28·8
6	2.4	172	47	48	135	**402**	**1·4**
	3.3	4514	1627	1378	1756	**9275**	**31·9**
	4.2+	490	118	77	31	**716**	**2·5**
	5.1+	4	—	—	—	**4**	0·01
	G(1×) ...	68	33	36	34	**171**	0·6
	G(2×) ...	1	—	—	—	**1**	0·003
	Total	**5249**	**1825**	**1539**	**1956**	**10569**	**36·4**
	A.3.....	5283	1991	1576	2225	11075	38·1
				(G:		172	0·6)
7	2.5	1	1	—	12	**14**	0·05
	3.4	1154	249	333	971	**2707**	**9·3**
	4.3	442	148	81	105	**776**	**2·7**
	5.2+	4	—	—	—	**4**	0·01
	G(1×) ...	181	99	75	73	**428**	**1·5**
	G(2×) ...	1	—	1	—	**2**	0·01
	Total	**1783**	**497**	**490**	**1161**	**3931**	**13·5**
	A.4.....	1408	318	395	1122	3243	11·2
				(G:		430	1·5)
8	3.5	26	10	8	55	**99**	0·3
	4.4	80	20	14	16	**130**	0·5
	5.3	6	2	3	1	**12**	0·04
	G(1×) ...	165	161	93	104	**523**	**1·8**
	G(2×) ...	5	—	3	2	**10**	0·03
	Total	**282**	**193**	**121**	**178**	**774**	**2·7**
	A.5.....	28	14	9	69[1])	120	0·4
				(G:		533	1·8)

[1]) One specimen represents the Life-Cycle-Class: 3·6.

Table 10 (continued).

Age-Classes	Life-Cycle Classes	Tornio River	Kemi Valkeakari etc.	Kemi River	Oulu River	Total	Percentage
9	4.5	1	3	1	2[1])	**7**	0·02
	5.4	2	2	—	—	**4**	0·01
	G(1×) ...	40	25	7	24	**96**	0·3
	G(2×) ...	15	4	2	5	**26**	0·1
	Total	**58**	**34**	**10**	**31**	**133**	0·4
10	G(2×) ...	24	14	5	13	**56**	0·2
	G(4×) ...	1	—	—	—	**1**	
11	G(2×) ...	4	2	1	1	**8**	0·03
	G(3×) ...	—	1	—	1	**2**	
12	G(3×) ...	—	2	1	1	**4**	0·01
Grand Total ..		**16110**	**5044**	**3142**	**4765**	**29061**	100·0

Combination B.

1. Life-cycle groups on their second ascent:

	Number	Per mille		Number	Per mille
A.1+G+	50	1·72	A.2+G+	21	0·72
A.1+G 1	145	4·99	A.2+G 1	249	8·57
A.1+G 2	120	4·13	A.2+G 2	6	0·21
A.1+G 3	2	0·07			
Total	317	10·91	Total	276	9·50

	Number	Per mille		Number	Per mille
A.3G+	85	2·92	A.4G+	13	0·45
A.3G 1	523	18·00	A.4G 1	54	1·86
A.3G 2	0	—			
Total	608	20·92	Total	67	2·31

2. Life-cycle groups on their third ascent:

	Number	Per mille		Number	Per mille
A.1+G+ G+	1	0·03	A.2+G+G+	1	0·03
A.1+G 1 G+	1	0·03	A.2+G 1 G+	4	0·14
A.1+G 1 G 1	0	—	A.2+G 1 G 1	22	0·76
A.1+G 2 G 1	1	0·03	A.2+G 2 G 1	1	0·03
Total	3	0·10	Total	28	0·96

	Number	Per mille
A.3 G+ G+	4	0·14
A.3 G 1 G+	3	0·10
A.3 G 1 G 1	61	2·10
A.4 G 1 G 1	3	0·10
Total	71	2·44

(Cont. page 36)

Appendix to Table 10. The previously spawned Salmon.

(Number and Percentage.)

Age-Classes	Life-Cycle Classes	Tornio River	Kemi Valkeakari	Kemi River	Oulu River	Total	Percentage (and Number)		
	Once spawned.								
4	2.1+G+	—	1	1	3	5	0·4	0·4	
5	2.1+G1	2	1	3	2	8	0·6	51	
	3.1+G+	29	6	1	7	43	3·1	3·7 %	
6	2.1+G2	2	1	1	2	6	0·4		
	3.1+G1	55	25	21	26	127	9·2		
	4.1+G+	1	—	—	1	2	0·1	171	
	2.2+G1	—	2	6	5	13	0·9	12·4 %	
	3.2+G+	9	2	7	—	18	1·3		
	2.3G+	1	3	1	—	5	0·4		
7	3.1+G2	47	17	5	29	98	7·1		
	4.1+G1	6	3	—	1	10	0·7		
	3.2+G1	87	47	48	23	205	14·8	424	
	4.2+G+	2	1	7	—	3	0·2	30·6 %	
	2.3G1	7	2	15	12	28	2·0		
	3.3G+	31	25	—	7	78	5·6		
	2.4G+	1	—	—	1	2	0·1		
8	3.1+G3	1	1	—	—	2	0·1		
	4.1+G2	7	5	—	3	15	1·1		
	3.2+G2	1	—	1	3	5	0·4		
	4.2+G1	17	9	5	—	31	2·2	521	
	3.3G1	133	140	84	93	450	32·6	37·6 %	
	4.3G+	—	2	—	—	2	0·1		
	2.4G1	—	—	2	2	4	0·3		
	3.4G+	6	2	1	2	11	0·8		
9	5.1+G2	—	1	—	—	1	0·07		
	4.2+G2	—	1	—	—	1	0·07	96	
	4.3G1	27	13	1	3	44	3·2	6·9 %	
	3.4G1	13	10	6	21	50	3·6		
	Total:	485	320	216	246	1267	91·6		
	Twice spawned								
6	3.1+G+G+	1	—	—	—	1	0·07	1	0·07 %
7	3.1+G1G+	1	—	—	—	1	0·07	2	
	3.2+G+G+	—	—	1	—	1	0·07	0·14 %	
8	2.2+G1G1	—	—	1	—	1	0·07		
	3.2+G1G+	3	—	—	1	4	0·3	10	
	2.3G1G+	—	—	—	1	1	0·07	0·7 %	
	3.3G+G+	2	—	2	—	4	0·3		
9	3.2+G1G1	11	4	2	2	19	1·4	25	
	2.3G1G1	2	—	—	2	4	0·3	1·8 %	
	3.3G1G+	2	—	—	—	2	0·14		
10	4.1+G2G1	1	—	—	—	1	0·07		
	4.2+G1G1	1	1	—	—	2	0·14	56	
	3·3G1G1	22	13	5	12	52	3·8	4·0 %	
	2·4G1G1	—	—	—	1	1	0·07		
11	4.2+G2G1	—	1	—	—	1	0·07	8	
	4.3G1G1	3	1	1	—	5	0·4	0·6 %	
	3.4G1G1	1	—	—	1	2	0·14		
	Total:	50	20	12	20	102	7·4		

Appendix to Table 10 (continued).

Age-Classes	Life-Cycle Classss	Tornio River	Kemi Valkeakari	Kemi River	Oulu River	Total	Percentage (and Number)	
	Three times spawned							
11	4.1+G1G1G1	—	1	—	—	1	0·07	2
	3.2+G1G1G1	—	—	—	1	1	0·07	0·14 %
12	3.3G1G1G1	—	2	1	1	4	0·3	
	Total:	—	3	1	2	6	0·4	
	Four times spawned							
10	5.1+G+G+G+G+	1	—	—	—	1	0·07	
	Grand Total	536	344	229	268	1377	99·5	
	Kelts:[1])	—	5	—	2	7	0·5	

[1]) The Kelts were: one (4.3G) and four (3.3G) from Valkeakari, one (3.3G) and one (3.3G1G) from Oulu River.

Table 11.

Specimens investigated from the northern Part of the Bothnian Bay Area since 1917.

(Adequate collections not before the year 1925.)

The Life-Cycle Groups.

Number

	1917–35			1936–44			1917–44		
A.+	24			2			26		
A.1+	2414			4880			7294		
A.2+	5948	18062	20079	8357	19432	22675	14305	37494	42754
A.3	12114			11075			23189		
A.4	2017			3243			5260		
A.5	176			119			295		
A.6	2			1			3		
G	1157			1384			2541		
Total	23852			29061			52913		

Percentage

	1917–35			1936–44			1917–44		
A.+	0·1			16·8			13·8		
A.1+	10·1								
A.2+	24·9	75·7	84·1	28·8	66·9	78·1	27·0	70·8	80·8
A.3	50·8			38·1			43·8		
A.4	8·4			11·2			10·0		
A.5	0·7			0·4			0·6		
A.6	0·01								
G	5·0			4·7			4·8		
	100·0			100·0			100·0		

3. Life-cycle groups on their fourth ascent:

	Number	Per mille		Number	Per mille
A.1+G1G1G1	1	0·03	A.3G1G1G1	4	0·14
A.2+G1G1G1	1	0·03			
Total	2	0·07	Total	4	0·14

The smolt age of the salmon from the Bothnian Bay area in the years 1936—1944 was as follows:

Age:	2 years		3 years	
	Number	%	Number	%
Tornio River	892	5·5	13,754	85·4
Valkeakari, Pensaskari	544	11·9	3,650	80·0
Kemi River	299	9·5	2,653	84·4
Ii, Simoniemi	45	9·4	425	88·5
Oulu River	731	15·3	3,848	80·8
Total	2,511	8·6	24,330	83·8

Age:	4 years		5 years	
	Number	%	Number	%
Tornio River	1,447	9·0	17	0·1
Valkeakari, Pensaskari	365	8·0	5	0·1
Kemi River	187	6·0	3	0·1
Ii, Simoniemi	10	2·1	—	—
Oulu River	185	3·9	1	0·02
Total	2,194	7·5	26	0·1

All other information concerning further fluctuations in the material of the years 1936—1944 is dealt with in Tabs. 4—10.

The material in Tabs. 4—10 gives a picture of *the periodicity of salmon fishing as well as of the different conditions prevailing at different times in the stock of salmon.* For this purpose the information given in the tables must be converted into figures indicating the frequency of each year-class. The grouping has been performed in Tables 11—16 with a summary in Table 17; the last table thus *comprises the information as to the value of the year-classes of the whole Bothnian Bay fishing area based on age determinations from the scales.* In order to extend the survey over a longer period data on the value of the year-classes during the years 1931—1935 have been included in Table 17, in so far as they relate to fishing in the Tornio River, Valkeakari fishing grounds, Kemi River and Oulu River (l. c. pp. 67—71). The year 1931 has been chosen as the starting point in this table because the representative series of observations from the Tornio River were commenced in that year.

Comparison between the value of the different year-classes is hampered by the changes caused by the stopping of the collections at some stations. It is particularly unfortunate that collecting was stopped at the well-known Valkeakari fishing grounds in 1940. The collections made in the parishes of Ii and Simoniemi have only to a very small extent been able to fill this gap. Statistics concerning the year-class 1936/1937 and earlier year-classes are scanty.

First we will study the question from Table 17: to what extent do the results of the age determinations as compared to the frequency of the different year-classes correspond to the classification of the catches of different years which was treated in the preceding chapter (Tables 1 and 2) and to the summaries on pages 16, 17 and 18.

According to Table 1 the year-classes 1927/1928, 1934/1935 and 1936/1937 belong to class *a* on the basis of their parent generations, and they have contributed to the good yields in the years 1934, 1941 and 1943 when (according to Tab. 17) the catch amounted to 6572, 5002 and 4593 fish respectively.

According to Table 1 the year-class 1929/1930 originated from class *c*, but nevertheless it appeared abundantly in 1936, i. e., it gave class-*a* catches. According to Table 17 the share of the year-class 1929/1930 may also be considered to have belonged to class *a*, at least it was on the boundary between classes *a* and *b* — there were 4284 fish.

According to Table 1 the year-classes 1926/1927, 1928/1929, 1930/1931 and 1933/1934 belonged to those contributing class-*b* catches. The same fact can be observed from Table 17 regarding the two latter year-classes: there were 2949 salmon of year-class 1930/1931 and 3291 of year-class 1933/1934. The year-class 1926/1927 corresponds, according to Table 17, rather to class-*c* catches — only 1949 salmon. That this classification of year-class 1926/1927 is correct is also apparent from Table 1, when one takes into consideration that the year-class in question with its individuals belonging to the weight-class 7·5—13·0 (9·0—14·0) kg. did not raise the yield of 1933 to class *b*, but that this was done by a year-class one year younger, the abundant year-class 1927/1928; this year-class appeared (as 3.2+ class) as the dominant class in the catches of the year 1933 (l. c. p. 89); for instance in the Tornio River 51·4%; in the Kemi River region 61·5%; but in the Oulu River only 27·1%. — The year-class 1928/1929 was represented by 4286 salmon, thus it was between classes *a* and *b*.

According to Table 1 the year-classes 1924/1925, 1925/1926, 1931/1932, 1932/1933 and 1937/1938 were the poorest as shown by the catches of the years 1931, 1932, 1938, 1939 and 1944. The same fact is brought out by the figures in Table 17: there were only 1442 fish in year-class 1924/1925, 1145 in year-class 1931/1932, and 1291 in year-class 1937/1938; 2225 fish in year-class 1925/1926 and 1523 fish in year-class 1932/1933.

Figures for the individual abundance of the most

(Cont. page 41)

Table 12. **Salmon Year-Classes: Tornio River**

(l. c., Table 22, p. 67).

Year-Class	1930–1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936–1944
					Number						
1924/1925	**689**	0+ 2									**2**
1925/1926	**676**	0+ 9									**9**
1926/1927	**450**	0+20	0+ 4	0+1							**25**
1927/1928	**1975**	60+72	2+11	0+3	0+ 1						**149**
1928/1929	**1227**	277+52	16+15	0+5	0+ 5						**370**
1929/1930	**377**	826+ 2	65+11	2+7	1+ 6	0+ 2					**922**
1930/1931	**333**	762+ 2	110+ 0	18+2	1+10	0+10	0+ 1				**916**
1931/1932	**4**	167+ 0	44+ 3	35+0	18+ 7	8+26	0+ 1	0+ 1			**310**
1932/1933	—	10+ 0	57+ 0	119+0	109+ 5	141+39	7+12	—			**499**
1933/1934	—	—	3+ 0	340+0	407+ 0	623+16	49+22	3+ 4	0+ 1		**1468**
1934/1935	—	—	—	9+0	1344+ 0	1230+12	406+18	171+21	7+16	0+ 1	**3235**
1935/1936		—	—	—	111+ 0	376+ 0	253+ 0	1220+10	198+16	8+ 8	**2200**
1936/1937			—	—	—	14+ 0	125+ 0	749+ 6	1254+10	664+12	**2834**
1937/1938				—	—	—	5+ 0	62+ 0	196+ 1	597+ 6	**867**
1938/1939					—	—	—	1+ 0	112+ 0	1745+ 9	**1867**
1939/1940						—	—	—	1+ 0	419+ 0	**420**
1940/1941							—	—	—	17+ 0	**17**
1941/1942								—	—	—	—
1942/1943									—	—	—
1943/1944										—	—
Total ...	**5731**	2102+159	297+44	523+18	1991+34	2392+105	845+54	2206+42	1768+44	3450+36	**16110**
		2261	**341**	**541**	**2025**	**2497**	**899**	**2248**	**1812**	**3486**	

Year-Class	1936	1937	1938	1939	1940	1941	1942	1943	1944
				Percentage					
1924/1925	0·1								
1925/1926	0·4								
1926/1927	0·9	1·1	0·2						
1927/1928	5·8	3·8	0·5	0·04					
1928/1929	14·6	9·1	0·9	0·2					
1929/1930	36·6	22·3	1·7	0·4	0·1				
1930/1931	33·8	32·3	3·7	0·6	0·4	0·1			
1931/1932	7·4	13·8	6·5	1·2	1·4	0·1	0·04		
1932/1933	0·4	16·7	22·0	5·6	7·2	2·1	—		
1933/1934	—	0·9	62·8	20·1	25·6	7·9	0·3	0·05	
1934/1935	—	—	1·7	66·4	49·7	47·2	8·5	1·3	0·03
1935/1936				5·5	15·0	28·1	54·7	11·8	0·5
1936/1937					0·6	13·9	33·6	69·7	19·4
1937/1938						0·6	2·8	10·9	17·3
1938/1939							0·04	6·2	50·3
1939/1940								0·05	12·0
1940/1941								—	0·5
1941/1942									
1942/1943									—
1943/1944									—
Total ...	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Table 13. **Salmon Year-Classes: Kemi, Valkeakari**

(l. c., Table 23 partly, pp. 68—69).

Year-Class	1932	1933	1934	1935	1932—1935	1936	1937	1938	1939	1940	1936—1940
					Number						
1921/1922	0+ 7	0+ 1			**8**						
1922/1923	0+10	0+ 5			**15**						
1923/1924	11+26	0+ 4	0+ 4		**45**						
1924/1925	155+13	9+25	0+10	0+ 2	**214**	0+ 2					**2**
1925/1926	309+ 1	79+13	5+37	0+ 2	**446**	0+ 3	0+ 1				**4**
1926/1927	104+ 0	342+ 4	86+22	2+16	**576**	0+ 8	0+ 5				**13**
1927/1928	70+ 0	799+ 3	1069+12	109+20	**2082**	8+50	4+12	0+ 3	—	0+ 2	**79**
1928/1929	1+ 0	26+ 0	335+ 2	535+ 6	**905**	107+24	13+52	1+ 5	0+ 1	—	**203**
1929/1930	—	—	126+ 0	301+ 0	**427**	521+ 5	90+33	10+26	0+ 3	—	**688**
1930/1931	—	—	5+ 0	27+ 0	**32**	291+ 5	327+ 6	46+11	0+19	0+ 1	**706**
1931/1932	—	—	—	—	—	70+ 0	54+ 0	123+ 2	11+13	1+ 7	**281**
1932/1933	—	—	—	—	—	12+ 0	66+ 0	138+ 1	160+ 6	29+11	**423**
1933/1934			—	—	—	—	31+ 0	189+ 0	460+ 0	196+13	**889**
1934/1935				—	—	—	—	16+ 0	426+ 0	325+ 1	**768**
1935/1936						—	—	—	110+ 0	113+ 1	**224**
1936/1937							—	—	—	12+ 0	**12**
1937/1938								—	—	—	—
1938/1939									—	—	—
1939/1940										—	—
Total ...	650+57	1255+55	1626+87	974+46		1009+97	585+109	523+48	1167+42	676+36	
	707	**1310**	**1713**	**1020**	**4750**	**1106**	**694**	**571**	**1209**	**712**	**4292**

Year-Class	1932	1933	1934	1935	1936	1937	1938	1939	1940
				Percentage					
1921/1922	1·0	0·1							
1922/1923	1·4	0·4							
1923/1924	5·2	0·3	0·2						
1924/1925	23·8	2·6	0·6	0·2	0·2				
1925/1926	43·9	7·0	2·5	0·2	0·3	0·1			
1926/1927	14·7	26·4	6·3	1·8	0·7	0·7			
1927/1928	9·9	61·2	63·1	12·6	5·2	2·3	0·5	—	0·3
1928/1929	0·1	2·0	19·7	53·1	11·8	9·4	1·1	0·1	—
1929/1930	—	—	7·3	29·5	47·6	17·7	6·3	0·3	—
1930/1931	—	—	0·3	2·6	26·8	48·0	10·0	1·6	0·1
1931/1932	—	—	—	—	6·3	7·8	21·9	2·0	1·1
1932/1933		—	—	—	1·1	9·5	24·3	13·7	5·6
1933/1934			—	—	—	4·5	33·1	38·0	29·4
1934/1935				—	—	—	2·8	35·2	45·8
1935/1936					—	—	—	9·1	16·0
1936/1937						—	—	—	1·7
1937/1938							-	—	—
1938/1939								—	—
1939/1940									—
Total ...	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Table 14. **Salmon Year-Classes: Kemi River, Köngäs and Muurola**

(l. c., Table 23 partly, pp. 68—69).

Number

Year-Class	1932	1933	1934	1935	1932–35	1936	1937	1938	1939	1940	1941
1921/1922	0+1	0+1	0+ 1		**3**						
1922/1923	0+1	0+1	—	0+ 1	**3**						
1923/1924	0+2	—	0+ 2	—	**4**						
1924/1925	14+0	0+1	0+ 6	0+ 1	**22**	—	0+ 1				
1925/1926	41+0	16+4	4+20	0+ 1	**86**	0+ 1	—				
1926/1927	18+0	42+1	37+ 6	2+10	**116**	0+ 2	0+ 1				
1927/1928	4+0	142+0	634+ 4	128+15	**927**	9+41	1+ 0	0+ 1			
1928/1929	—	7+0	68+ 0	378+ 1	**464**	58+10	7+ 8	0+ 5	—	0+ 1	
1929/1930	—	—	4+ 0	135+ 0	**139**	190+ 1	12+ 1	3+13	0+ 1	—	
1930/1931	—	—	—	2+ 0	**2**	103+ 0	93+ 1	71+11	1+ 8	0+ 1	0+ 1
1931/1932	—	—	—	1+ 0	**1**	3+ 0	17+ 0	106+ 7	9+13	1+ 5	—
1932/1933		—	—	—	—	—	2+ 0	101+ 0	118+ 3	15+11	3+ 9
1933/1934			—	—	—	—	—	42+ 0	182+ 2	153+ 7	30+15
1934/1935				—	—	—	—	—	101+ 0	186+ 1	241+10
1935/1936						—	—	—	23+ 0	26+ 0	32+ 1
1936/1937							—	—	—	—	10+ 0
1937/1938								—	—	—	—
1938/1939									—		—
1939/1940										—	—
1940/1941											—
Total ...	77+4	207+8	747+39	646+29		363+55	132+12	323+37	434+27	381+26	316+36
	81	**215**	**786**	**675**	**1767**	**418**	**144**	**360**	**461**	**407**	**352**

(Continued below)

1942	1943	1944	1936–44	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
								Percentage								
(Continued from above)				1·2	0·5	0·1										
	Number			1·2	0·5	—	0·1									
				2·5	—	0·3	—									
			1	17·3	0·5	0·8	0·1	—	0·7							
			1	50·6	9·3	3·0	0·1	0·2	—							
			3	22·2	20·0	5·5	1·8	0·5	0·7							
			52	5·0	66·0	81·2	21·2	12·0	0·7	0·3						
			89	—	3·2	8·6	56·2	16·3	10·4	1·4	—	0·2				
			221	—	—	0·5	20·1	45·7	9·0	4·4	0·2	—				
			290	—	—	—	0·3	24·6	65·3	22·7	2·0	0·2	0·3			
0+ 1			**162**	—	—	—	0·1	0·7	11·8	31·4	4·8	1·5	—	0·3		
—			**262**		—	—	—	—	1·4	28·1	26·2	6·4	3·4	—		
1+ 4			**436**			—	—	—	—	11·7	39·9	39·3	12·8	1·7		
28+ 6	0+ 3		**576**				—	—	—	—	21·9	46·0	71·3	11·7	0·7	
215+ 4	69+ 6	0+5	**381**					—	—	—	5·0	6·4	9·4	75·3	18·2	1·7
32+ 0	306+ 3	122+3	**476**						—	—	—	—	2·8	11·0	75·0	42·1
—	25+ 0	81+0	**106**							—	—	—	—	—	6·1	27·2
—	—	62+0	**62**								—	—	—	—	—	20·9
—	—	21+1	**22**									—	—	—	—	7·4
—	—	2+0	**2**										—	—	—	0·7
1941/1942	—	—	—											—	—	—
1942/1943	—	—	—												—	—
1943/1944		—	—													—
276+15	400+12	288+9	**3142**	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
291	**412**	**297**														

Table 16. **Salmon Year-Classes: Oulu River**

(l. c., Table 24, p. 70—71)

Number

Year-Class	1931–1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1936–1944
1925/1926	**899**	0+ 3									**3**
1926/1927	**716**	0+11									**11**
1927/1928	**1224**	23+31	2+ 2	0+ 4	0+ 1						**63**
1928/1929	**778**	210+19	17+16	0+ 5	0+ 1	—	0+ 1				**269**
1929/1930	**523**	801+12	125+15	10+19	0+ 1	0+ 3	0+ 1				**987**
1930/1931	**93**	243+ 4	231+ 4	71+11	5+ 6	0+ 1	0+ 1				**577**
1931/1932	**4**	97+ 0	82+ 0	175+ 3	11+ 4	1+ 3	0+ 6	0+ 1			**383**
1932/1933	—	8+ 0	21+ 0	115+ 2	141+ 2	29+ 3	4+ 9	0+ 3			**337**
1933/1934	—	—	2+ 0	155+ 2	125+ 1	170+ 4	19+ 7	4+ 9			**498**
1934/1935	—	—	—	29+ 0	147+ 0	77+ 1	85+ 5	60+ 8	1+ 1		**414**
1935/1936		—	—	—	10+ 0	15+ 1	24+ 0	79+ 1	17+ 4	7+11	**169**
1936/1937			—	—	—	3+ 0	4+ 0	124+ 1	109+ 1	546+ 3	**741**
1937/1938				—	—	—	—	31+ 0	41+ 0	131+ 2	**205**
1938/1939					—	—	—	—	9+ 0	39+ 0	**48**
1939/1940						—	—	—	—	10+ 0	**10**
1940/1941							—	—	—	—	—
1941/1942								—	—	—	—
1942/1943									—	—	—
1943/1944										—	—
Total ...		1382+80	480+37	555+46	439+16	295+16	136+30	298+23	177+ 6	733+16	
	4237	**1462**	**517**	**601**	**455**	**311**	**166**	**321**	**183**	**749**	**4765**

Percentage

Year-Class	1936	1937	1938	1939	1940	1941	1942	1943	1944
1925/1926	0·2								
1926/1927	0·8								
1927/1928	3·7	0·8	0·7	0·2					
1928/1929	15·7	6·4	0·8	0·2	—	0·6			
1929/1930	55·6	27·1	4·8	0·2	1·0	0·6			
1930/1931	16·9	45·4	13·7	2·4	0·3	0·6			
1931/1932	6·6	15·9	29·6	3·3	1·3	3·6	0·3		
1932/1933	0·5	4·0	19·5	31·5	10·3	7·8	0·9		
1933/1934	—	0·4	26·1	27·7	55·9	15·7	4·0		
1934/1935	—	—	4·8	32·3	25·1	54·2	21·2	1·1	
1935/1936	—	—	—	2·2	5·1	14·5	24·9	11·5	2·4
1936/1937		—	—	—	1·0	2·4	39·0	60·1	73·3
1937/1938			—	—	—	—	9·7	22·4	17·8
1938/1939				—	—	—	—	4·9	5·2
1939/1940					—	—	—	—	1·3
1940/1941						—	—	—	—
1941/1942							—	—	—
1942/1943								—	—
1943/1944									—
Total ...	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Table 17. **The Year-Classes of Specimens investigated**

(l. c., p. 67 upper).

Year-Class	1931—1935			1936—1944					Total	Difference from the Average[1])	Placing in the Table 1	New Year-Class	
	Tornio River	Kemi River and Valkeakari	Oulu River	Tornio River	Kemi, Valkeakari	Kemi River	Simoniemi etc.	Oulu River				Life-Cycle 3·3(+)	Placing in the Class
	Number			Number									
1924/1925	565	376	496	2	2	1			**1442**	—1518	Class *c*	1931	Class *c*
1925/1926	621	698	889	9	4	1		3	**2225**	—735	Class *c*	1932	Class *c*
1926/1927	449	732	716	25	13	3		11	**1949**	—1011	Class *c*	1933	Class *b*
1927/1928	1975	3030	1224	149	79	52		63	**6572**	+3612	Class *a*	1934	Class *a*
1928/1929	1227	1350	778	370	203	89		269	**4286**	+1326	Class *b*	1935	Class *b*
1929/1930	377	566	523	922	688	221		987	**4284**	+1324	Class *c*	1936	Class *a*
1930/1931	333	34	93	916	706	290		577	**2949**	—11	Class *b*	1937	Class *b*
1931/1932	4	1	4	310	281	162		383	**1145**	—1815	Class *c*	1938	Class *c*
1932/1933				499	423	262	2	337	**1523**	—1437	Class *c*	1939	Class *c*
1933/1934				1468	889	436	—	498	**3291**	+331	Class *b*	1940	Class *b*
1934/1935				3235	768	576	9	414	**5002**	+2042	Class *a*	1941	Class *a*
1935/1936				2200	224	381	124	169	**3098**	+138	Class *b*	1942	Class *a*
1936/1937				2834	12	476	480	791	**4593**	+1633	Class *a*	1943	Class *a*
1937/1938				867		106	113	205	**1291**	—1669	Class *b*	1944	Class *c*
1938/1939				1867		62	22	48	**1999**	—	—	(1945)	—
1939/1940				420		22	2	10	**454**	—	—	(1946)	—
1940/1941				17		2	—	—	**19**	—	—	(1947)	—
Total ...	**5551**	**6787**	**4723**	**16110**	**4292**	**3142**	**752**	**4765**	**46122**				

[1]) As a basis for comparison the average of the years 1931—1940 (= 2960 individuals) has been taken. This average has been used also as regards the years 1941—1944, although there were no samples for these years from the Valkeakari fishing grounds. An obviously incorrect result is obtained only regarding the year 1942.

recent year-classes must remain incomplete because the final generation had not reached its seventh year in 1944. This applies particularly to year-classes 1939/1940 and 1940/1941. (The former, however, seems to have brought a notable compensation in the summer of 1944 for the shortage which the obvious scarcity of individuals of the year-class 1937/1938 caused in the yield.)

On the basis of the preceding paragraphs it appears that *the combination set forth in Table 17 gives effective support to the estimates of individual abundance, i. e., the importance in creating a stock and the share of the different year-classes in the catches, which are dealt with in Table 1* on the basis of other material.

Tables 12—16 give the details of the figures and estimates given above from different fishing regions and in different years.

Mention was made in the foreword that salmon fishing at the mouths of the Kokemäki River and Kymi River has shown a very notable decline during the last eight years. In the year 1936, 277 salmon were caught at the Lukkarinsanta netting station

Table 15.

Salmon Year-Classes: Bothnian Bay.

Ii, Simoniemi and Alatornio.

	Ii (one Ground)	Simoniemi and Alatornio (two Grounds)	Ii (one Ground)	Total
	1942	1943	1944	
		Number		
1932/1933 ...		0+2		**2**
1933/1934 ...		0+0		**0**
1934/1935 ...	2+0	0+7		**9**
1935/1936 ...	43+0	74+7		**124**
1936/1937 ...	37+0	403+1	39+0	**480**
1937/1938 ...	4+0	90+0	19+0	**113**
1938/1939 ...	—	13+0	9+0	**22**
1939/1940 ...	—	—	2+0	**2**
1940/1941 ...	—	—	—	—
1941/1942 ...	—	—	—	—
1942/1943 ...		—	—	—
1943/1944 ...			—	—
Total ...	**86**	**597**	**69**	**752**

Table 18. **Division of Salmon into Life-Cycle Classes** **Kokemäki River.**

according to Scale Samples (l. c. Table 15, p. 49).

Age-Class	Life-Cycle Class	1936	1937	1938	1939	1940	1941	1942	1936—1942	1936	1937	1938	1939	1940	1942
		Number								Percentage					
3	2.1+	1	—	3	1	1	—	—	**6**	0·4	—	2·4	1·7	1·4	—
4	2.2+	13	9	9	6	5	—	3	**45**	4·7	5·3	7·2	10·0	7·1	6·8
5	2.3	175	72	34	20	43	3	31	**378**	63·2	42·9	27·2	33·3	61·4	70·4
	3.2+	6	—	8	1	2	—	1	**18**	2·2	—	6·4	1·7	2·9	2·3
6	2.4	26	26	10	3	2	1	—	**68**	9·4	15·5	8·0	5·0	2·9	—
	3.3	32	32	14	10	4	—	4	**96**	11·5	19·0	11·2	16·6	5·7	9·1
7	2.5	—	2	1	—	—	—	—	**3**	—	1·2	0·8	—	—	—
	3.4	2	1	2	1	1	—	1	**8**	0·7	0·6	1·6	1·7	1·4	2·3
	Total ...	**255**	**142**	**81**	**42**	**58**	(4)	**40**	**622**	**92·1**	**84·5**	**64·8**	**70·0**	**82·8**	**90·9**
	Once spawned:														
5	2.1+G1	—	1	—	—	3	—	1	**5**						
6	2.1+G2	—	1	1	—	1	—	—	**3**						
	3.1+G1	—	1	—	2	—	—	—	**3**						
	2.2+G1	4	2	3	3	—	—	3	**15**						
	2.3G+	—	—	—	1	—	—	—	**1**						
7	3.2+G1	1	—	1	1	1	—	—	**4**	6·8	13·7	32·8	23·3	14·3	9·1
	2.3G1	12	15	26	3	2	—	—	**58**						
8	3.3G1	2	2	9	3	3	—	—	**19**						
	2.4G1	—	1	1	—	—	—	—	**2**						
	3.4G+	—	—	—	1	—	—	—	**1**						
	Total ...	**19**	**23**	**41**	**14**	**10**	—	**4**	**111**						
	Twice spawned:														
9	2.3G1G1	3	2	2	3	2	—	—	**12**						
10	3.3G1G1	—	1	1	—	—	—	—	**2**						
	Three times spawned:									1·1	1·8	2·4	6·7	2·9	—
12	3.3G1G1G1	—	—	—	1	—	—	—	**1**						
	Life-Cycle Group:														
	A.1+	1	—	3	1	1	—	—	**6**	0·4	—	2·4	1·7	1·4	—
	A.2+	19	9	17	7	7	—	4	**63**	6·9	5·3	13·6	11·7	10·0	9·1
	A.3	207	104	48	30	47	3	35	**474**	74·7	61·9	38·4	50·0	67·1	79·5
	A.4	28	27	12	4	3	1	1	**76**	10·1	16·1	9·6	6·6	4·3	2·3
	A.5	—	2	1	—	—	—	—	**3**	—	1·2	0·8	—	—	—
	G	22	26	44	18	12	1	4	**127**	7·9	15·5	**35·2**	**30·0**	17·2	9·1
	Total ...	**277**	**168**	**125**	**60**	**70**	5	**44**	**749**	100·0	100·0	100·0	100·0	100·0	100·0

on the Kokemäki River, immediately above the town of Pori, and samples of scales together with measurements were supplied; in 1939 and 1940 the catch was no more than 60 to 70 and in 1942 only 44 (in 1941 salmon fishing was discontinued for other reasons). Similarly fishing at the Langinkoski and Ränninkoski Rapids of the Kymi River gave 310 salmon in 1936, but in 1937 only 70 and in 1938 only 57; in 1939 it was reduced to 17. This very small catch brought about the stoppage of the fishery. A trial in 1943 gave no further encouragement. In spite of the fact that the catches from these fishing grounds are of no significance to the questions we have been considering, I will nevertheless deal with them in an appendix to this chapter: — Tables 18 and 19.

The considerable number of salmon which have previously spawned deserves special attention in these tables; in certain years it has amounted to 30% and sometimes even more. In the Kokemäki River (Lukkarinsanta netting station) the number of salmon

Table 18 (continued). Year-Classes (l. c., Table 25, p. 69)

Year-Class	1931–1935	1936	1937	1938	1939	1940	1942	1931–1942
1926/1927	**49**	0+ 3	0+1	—	0+1			**54**
1927/1928	**42**	0+ 2	0+2	0+1	—			**47**
1928/1929	**155**	2+13	0+3	0+2	—			**175**
1929/1930	**115**	58+ 4	3+15	0+10	0+3			**208**
1930/1931	**20**	181+ 0	58+4	3+27	0+4	0+2		**299**
1931/1932	—	13+ 0	72+1	24+4	1+4	0+3		**122**
1932/1933	—	1+ 0	9+0	42+0	13+6	1+3		**75**
1933/1934	—	—	—	9+0	21+0	6+1		**37**
1934/1935	—	—	—	3+0	6+0	45+3	1+0	**58**
1935/1936		—	—	—	1+0	5+0	4+3	(13)
1936/1937			—	—	—	1+0	32+1	**34**
1937/1938				—	—	—	3+0	**3**
Total ...	**381**	255+22 **277**	142+26 **168**	81+44 **125**	42+18 **60**	58+12 **70**	40+4 **44**	**1125**

which had previously spawned was in 1938 44 of the 125 caught (or 35·2%), and in 1939 it was 18 out of the 60 caught (30·0%). In the Kymi River in 1937 22 or 31·4% of the 70 salmon caught had previously spawned and in 1938 20 or 35·7% out of 56 fish. These high percentages are signs of a very low rate of reproduction of stock in recent years. Corresponding signs in the Kokemäki River have appeared earlier; for instance in the years 1927 and 1931 (l. c. p. 49), as well as at the Langinkoski Rapids of the Kymi River in the years 1922, 1924 and 1925 (l. c. p. 51) and at the Rännınkoski Rapids in 1925 (l. c. p. 57).

4. Probable Factors causing the Transition of Periods or their Interruption.

Using two different collections of material as a starting point we have been able to investigate in the foregoing chapters the periods and their duration in the Baltic stock of salmon since 1917.

An effort should now be made to explain the factors which, in certain cases, have caused the result of the reproduction of the stock to be other than that expected under the Eilert Sundt rule. In other words, *we must look for the causes which have made the yields at the end of a seven-year period to be in a catch category other than that to which the parent generation belonged.*

Difficulties arise in the exact and detailed verification of the factors to be taken into consideration. The observations I have utilized (see Table 2 and the graphs given in the appendices) do not seem sufficient to give a clear picture of the water-level conditions prevailing at the breeding grounds during the winter, because they were made in the lower reaches of the rivers, particularly in the Tornio River (Kukkolankoski Rapids) and in the Kemi River (Taivalkoski Rapids). But the general picture given by the water-level statistics is that in the Tornio River in winter there is a greater shortage of water than in the Kemi and Oulu Rivers, in other words after the spawning season the fall in the water level is greater in the Tornio River than in the Kemi and Oulu Rivers. For this reason the latter rivers would seem to provide better breeding conditions than the Tornio. On the other hand, since there is a steeper fall in the Tornio River and the smallest number and area of lakes to collect and balance the water, the autumn flood may be disproportionately high and may cause greater differences between the water levels of early autumn and winter.

A. The Transition of a Period to a higher Class.

The yield of the year 1936 fell into class *a* although the year-class 1929/1930 from which it originated, was in class *c*. This result may have been brought about by the following factors: (a) in the winter there was "high water" in the rivers — in the Tornio River from October to February with occasional low water; (b) the winter was unusually mild — a total only of 571 minus degrees (one observation each day); in autumn and early winter (October—December) the weather was exceptionally warm, a total of only 66 minus degrees.

Possibly corresponding factors have caused the transition of the year-class 1914/1915 from class *c* in 1914 to class *a* in 1921. The autumn and early winter of the year 1914 was mild — from October to December there was a total of only 171 minus degrees — although during late winter and spring there was a total of 939 minus degrees. Also the water-level conditions at least in the Kemi and Oulu Rivers were favourable during this winter (l. c. p. 94 and Table 2).

The autumn and early winter of 1935 too were mild: 138 minus degrees, nevertheless the winter

Table 19. **Division of Salmon into Life-Cycle Classes** according to Scale Samples (l. c., Tables 16 and 17, pp. 50—51 and 56—57). **Kymi River.** (Langinkoski and Ränninkoski.)

Ascending for the first time

Age-Class	Life-Cycle Class	1936	1937	1938	1939	1936–1939
3	2.1+	2	2	4	3	**11**
4	2.2+	48	3	—	11	**62**
	3.1+	2	—	2	—	**4**
5	2.3	151	24	4	1	**180**
	3.2+	4	2	1	2	**9**
6	2.4	24	8	4	—	**36**
	3.3	35	7	17	—	**59**
7	3.4	6	2	3	—	**11**
8	3.5	—	—	1	—	**1**
	Total: ...	**272**	**48**	**36**	**17**	**373**
	Percentage	87·7				70·6

Once spawned

Age-Class	Life-Cycle Class	1936	1937	1938	1939	1936–1939
5	2.1+G1	1	2	—	—	**3**
	2.2+G+	—	1	—	—	**1**
6	3.1+G1	1	—	—	—	**1**
	2.2+G1	2	4	2	—	**8**
	2.3G+	2	1	—	—	**3**
7	3.2+G1	—	2	1	—	**3**
	2.3G1	20	7	7	—	**34**
8	3.3G1	3	2	3	—	**8**
	2.4G1	—	1	—	—	**1**
		29	**20**	**13**	—	**62**

Life-Cycle Group

A.1+	4	2	6	3	**15**
A.2+	52	5	1	13	**71**
A.3	186	31	21	1	**239**
A.4	30	10	7	—	**47**
A.5	—	—	1	—	**1**
G	38	22	21	—	**81**
Total ...	**310**	**70**	**57**	**17**	**454**

Twice spawned

Age-Class	Life-Cycle Class	1936	1937	1938	1939	1936–1939
8	2.2+G1G1	5	1	—	—	**6**
9	3.2+G1G1	1	—	—	—	**1**
	2.3G1G1	2	—	5	—	**7**
10	3.3G1G1	1	1	1	—	**3**
		9	**2**	**6**	—	**17**

Three times spawned

11 2.3G1G1G1 1938: 2 Ind.

The above-mentioned specimens represent Year-Classes as follows: (l. c. Tab. 26, pp. 72—73).

Year-Class	1936—1938	1929—1938
1925/1926	0+ 1[1])	**113**
1926/1927	0+ 6	**465**
1927/1928	0+ 8	**518**
1928/1929	6+29	**373**
1929/1930	62+17	**229**
1930/1931	173+14	**225**
1931/1932	97+ 5	**122**
1932/1933	10+ 0	**10**
1933/1934	4+ 0	**4**
1934/1935	4+ 0	**4**
Total ...	**356+80**	**2063**

There was no fishing in the years 1940—42. In the year 1943 fishing was tried again, but only 8 salmon were caught (and in addition 4 sea trout). Of these five belonged to class 3.3, one to 3.1+ and one to 3.2+.

1935/1936 as a whole was fairly cold: 1186 minus degrees. But since even in the Tornio River the water level was at an average height for a considerable time, and the conditions in the Oulu River were favourable, the rise of the year-class 1935/1936 from class *b* in 1935 to class *a* in 1942 may be ascribed to these conditions.

On the other hand even a very cold winter does not seem to prevent the development of an abundant year-class, *provided it is bred from an abundant parent generation*. An example of this is the year-class 1927/1928, which was in its seventh year in 1934. In the winter 1927/1928 the frost degrees in the autumn were 622, in the winter season 748, giving a total of 1370 minus degrees. The water-level conditions were good in the Kemi River, but possibly under the average in the Tornio and Oulu Rivers. Nevertheless the period remained unchanged in class *a*.

The main reason for the transition of the year-class 1915/1916 from class *b* in 1915 to class *a* in 1922 seems to have been the relatively advantageous

water-level conditions during the winter: even in the Tornio River the water level fell to a considerable extent only in October. The autumn and early winter, October to December, were exceptionally cold — 771 minus degrees; whereas from mid-winter to spring it was mild — thus a total of 1410 minus degrees.

The rise of the year-class 1926/1927 may have been due to advantageous water level conditions, particularly in the Oulu River.

B. The Transition of a Period to a lower Class.

The real cause for the transition of the year-class 1921/1922 from class *a* of its parent generation (1921) to class *b* in 1928 is not adequately explained by the factors we are now considering. Frost conditions in the winter 1921/1922 were rather severe, the temperature in the autumn amounted to 497 minus degrees and from January to spring 878, making a total of 1375 degrees. The water level conditions in the Tornio River (Kukkolankoski Rapids) were unfavourable, in the Kemi River (Taivalkoski Rapids- and most likely in the Oulu River (Sotkajärvi Lake) they were favourable.

The reasons for the transition of the year-class 1922/1923 from class *a* (1922) to class *c* in the year 1929 are at present inexplicable. The winter of that year was cold: 1246 minus degrees; the water-level conditions in the Tornio and Oulu Rivers were indeed unfavourable, but in the Kemi River they seemed to be good. Perhaps the deterioration may be attributed to the water-level conditions in the first two rivers.

The transition of the year-class 1937/1938 from class *b* to class *c* in 1944 may be due to the unfavourable water-level conditions prevailing in the Tornio and Kemi Rivers. The winter was mild: a total of 792 minus degrees.

Earlier (l. c. p. 99) I have suggested that the transition of the year-class 1917/1918 from class *b* of its parent generation (1917) to class *c* in 1924 may have been due to the troubles and the severe want which prevailed in Finland in the autumn of 1917. All kind of fishing and poaching increased greatly[1]), and must have reduced seriously the number of salmon which spawned. The most significant factor in the deficiency of the new year-class appears to have been the small number of spawning salmon. The temperature in the autumn season 1917/1918 was 266 minus degrees — thus relatively mild, in the winter 827 minus degrees, making a total of 1113 minus degrees. The water-level conditions were favourable, in at least the Kemi and Oulu Rivers (l. c. p. 97 and Table 2).

The importance of the water-level conditions as a factor influencing the abundance of the new year-class appears from the following survey of the fluctuations in water level during the years 1921—1937 in the Oulu and Kemi Rivers and of the catch classes to which on the one hand the parent generation and on the other hand the new year-class in its seventh year have belonged. The estimate of the water-level conditions is based on the graphs given in the appendices to this report. It is suggested that the conditions have been favourable during the winters when the level has not fallen below that which prevailed during the spawning season and that the greater the fall below this level the more unfavourable have the conditions been.

[1]) The war-time shortage of food led to fishing during the spawning period, first of all illegally and then from September 1917 to December 1st 1919 legally, in so far as seines could be worked throughout the year in the upper waters of Tornio and Kemi Rivers (in the Lapland district). Fishing with rod and line was allowed along the entire length of both rivers.

1. Oulu River

(*a*) *Water-level Conditions which seemed favourable*:

1925/1926:	parent	generation	in	class *c*	the	year-class	in	class *c* (1932)
1926/1927	,,	,,	,,	*class c*	,,	,,	,,	*class b* (1933)
1930/1931	,,	,,	,,	class *b*	,,	,,	,,	class *b* (1937)
1934/1935	,,	,,	,,	class *a*	,,	,,	,,	class *a* (1941)
1935/1936	,,	,,	,,	*class b*	,,	,,	,,	*class a* (1942)
1936/1937	,,	,,	,,	class *a*	,,	,,	,,	class *a* (1943)
1937/1938	,,	,,	,,	*class b*	,,	,,	,,	*class c* (1944)

(*b*) *Water-level Conditions which seemed unfavourable*:

1921/1922:	parent	generation	in	*class a*	the	year-class	in	*class b* (1928)
1922/1923	,,	,,	,,	*class a*	,,	,,	,,	*class c* (1929)
1927/1928	,,	,,	,,	class *a*	,,	,,	,,	class *a* (1934)
1931/1932	,,	,,	,,	class *c*	,,	,,	,,	class *c* (1938)
1932/1933	,,	,,	,,	class *c*	,,	,,	,,	class *c* (1939)
1933/1934	,,	,,	,,	class *b*	,,	,,	,,	class *b* (1940)

(*c*) *Water-level Conditions which seemed average*:

1923/1924:	parent	generation	in	class *b*	the	year-class	in	class *b* (1930)
1924/1925	,,	,,	,,	class *c*	,,	,,	,,	class *c* (1931)
1928/1929	,,	,,	,,	class *b*	,,	,,	,,	class *b* (1935)
1929/1930	,,	,,	,,	*class c*	,,	,,	,,	*class a* (1936)

2. Kemi River

(*a*) *Water-level Conditions which seemed favourable*:

1921/1922: parent generation in *class a* the year-class in *class b* (1928)
1922/1923 „ „ „ *class a* „ „ „ *class c* (1929)
1925/1926 „ „ „ class *c* „ „ „ class *c* (1932)
1927/1928 „ „ „ class *a* „ „ „ class *a* (1934)
1928/1929 „ „ „ class *b* „ „ „ class *b* (1935)
1929/1930 „ „ „ *class c* „ „ „ *class a* (1936)
1930/1931 „ „ „ class *b* „ „ „ class *b* (1937)
1933/1934 „ „ „ class *b* „ „ „ class *b* (1940)
1934/1935 „ „ „ class *a* „ „ „ class *a* (1941)
1936/1937 „ „ „ class *a* „ „ „ class *a* (1943)

(*b*) *Water-level Conditions which seemed unfavourable*:

1923/1924: parent generation in class *b* the year-class in class *b* (1930)
1926/1927 „ „ „ *class c* „ „ „ *class b* (1933)
1932/1933 „ „ „ class *c* „ „ „ class *c* (1939)
1935/1936 „ „ „ *class b* „ „ „ *class a* (1942)

(*c*) *Water-level Conditions which seemed average*:

1924/1925: parent generation in class *c* the year-class in class *c* (1931)
1931/1932 „ „ „ class *c* „ „ „ class *c* (1938)
1937/1938 „ „ „ *class b* „ „ „ *class c* (1944)

The water-level measurements made in the Tornio River (at the Kukkolankoski Rapids at the mouth of the river) generally indicate conditions which seem unfavourable; only the following winters seem favourable:

1930/1931: parent generation in class *b* the year-class in class *b* (1937)
1933/1934 „ „ „ class *b* „ „ „ class *b* (1940)
1936/1937 „ „ „ class *a* „ „ „ class *a* (1943)

The surveys given above do not give a clear picture of the importance of the water-level conditions on the size of the new year-classes. The fact which is most clearly brought forth in the surveys is the correlation in the size of the parent generation and the subsequent year-class in its adult stage. This fact is in complete agreement *with the basic rule of Eilert Sundt.*

I now propose to study other conditions which may affect the catches. The first possible factor is the extent to which the fishing for salmon weighing about half a kilo on the average (in Polish the so-called mielnica) — which at times is practised very intensively — causes a decrease in the catch of salmon in the Bothnian Bay area and in the breeding stock in the rivers. In Finland and Sweden the effect is generally supposed to be detrimental but very little material is available because statistics of catch from the long coastal region belonging to Germany are given in kg. only and the small salmon (mielnica) are not shown separately from the larger fish. The only basis for investigating this question are the special statistics of the mielnica fishing in the small Polish coastal area.

Yield of Mielnica (small salmon) in Poland.

	Number	kg.		Number	kg.
1922	**107,284**	53,642	1931	22,831	12,900
1923	9,432	4,716	1932	**50,008**	25,590
1924	7,470	3,735	1933	30,335	13,210
1925	13,010	6,505	1934	7,604	3,590
1926	**56,742**	28,371	1935	6,982	3,390
1927	**77,590**	38,795	1936	12,234	5,760
1928	**61,136**	30,568	1937	5,064	2,420
1929	20,524	10,262	1938	2,236	1,100
1930	**42,100**	21,050			

The statistics for 1922—1935 were obtained from Polish sources (cp. l. c. p. 17, Table 9), for 1936—1938 from Rapp. et Proc.-Verb., Vols. No. 105, 107 and 109 (Salmon and Trout Committee).

If we suppose, as there is reason to do, that the mielnica migrating to the southern parts of the Baltic have mostly come from the salmon rivers of the Bothnian Bay, the parr life of the majority has lasted three years. In this event those in group A.+ would be in their fourth year and those in group A.1+ in their fifth year. Working on this supposition we will compare the Polish catches of mielnica with the catch classes to which the corresponding year-classes in

their seventh year — chiefly representing the life-cycle class 3.3 — have contributed in Finland.

The results of the mielnica fishing in Poland have fluctuated greatly between the years 1922 and 1938; the mean result for the years 1922—1935 was 35,361. We will use this figure as a basis in the two following surveys for the comparative estimate of the mielnica catch results.

1. If the mielnica chiefly represent the life-cycle class 3.1 a comparison leads to the following results:

(*a*) *Mielnica catches above the average*:

Year-Class	Parent Generation	The number of Mielnica	Catches in Finland at the Stage 3·3
1917/1918	*class b*	+71·923 (1922)	*class c* (1924)
1921/1922	*class a*	+21·381 (1926)	*class b* (1928)
1922/1923	*class a*	+42·229 (1927)	*class c* (1929)
1923/1924	class *b*	+25·775 (1928)	class *b* (1930)
1925/1926	class *c*	+6·739 (1930)	class *c* (1932)
1927/1928	class *a*	+14·647 (1932)	class *a* (1934)

(*b*). *Mielnica catches going below the average*:

Year-Class	Parent Generation	The number of Mielnica	Catches in Finland at the Stage 3·3
1918/1919	class *c*	—25·929 (1923)	class *c* (1925)
1919/1920	class *c*	—27·891 (1924)	class *c* (1926)
1920/1921	class *a*	—22·351 (1925)	class *a* (1927)
1924/1925	class *c*	—14·837 (1929)	class *c* (1931)
1926/1927	*class c*	—12·530 (1931)	*class b* (1933)
1928/1929	class *b*	—5·026 (1933)	class *b* (1935)
1929/1930	*class c*	—27·757 (1934)	*class a* (1936)
1930/1931	class *b*	—28·379 (1935)	class *b* (1937)
1931/1932	class *c*	—23·127 (1936)	class *c* (1938)
1932/1933	class *c*	—30·297 (1937)	class *c* (1939)
1933/1934	class *b*	—33·025 (1938)	class *b* (1940)

2. On the other hand if we assume that the majority of the mielnica caught belong to the life-cycle class 3.+, we get the following combinations:

(*a*) *Mielnica catches above the average*:

Year-Class	Parent Generation	The number of Mielnica	Catches in Finland at the Stage 3·3
1918/1919	class *c*	+71·923 (1922)	class *c* (1925)
1922/1923	*class a*	+21·381 (1926)	*class c* (1929)
1923/1924	class *b*	+42·229 (1927)	class *b* (1930)
1924/1925	class *c*	+25·775 (1928)	class *c* (1931)
1926/1927	*class c*	+6·739 (1930)	*class b* (1933)
1928/1929	class *b*	+14·647 (1932)	class *b* (1935)

(*b*) *Mielnica catches going below the average*:

Year-Class	Parent Generation	The number of Mielnica	Catches in Finland at the Stage 3·3
1919/1920	class *c*	—25·929 (1923)	class *c* (1926)
1920/1921	class *a*	—27·891 (1924)	class *a* (1927)
1921/1922	*class a*	—22·351 (1925)	*class b* (1928)
1925/1926	class *c*	—14·837 (1929)	class *c* (1932)
1927/1928	class *a*	—12·530 (1931)	class *a* (1934)
1929/1930	*class c*	—5·026 (1933)	*class a* (1936)
1930/1931	class *b*	—27·757 (1934)	class *b* (1937)
1931/1932	class *c*	—28·379 (1935)	class *c* (1938)
1932/1933	class *c*	—23·127 (1936)	class *c* (1939)
1933/1934	class *b*	—30·297 (1937)	class *b* (1940)
1934/1935	class *a*	—33·025 (1938)	class *a* (1941)

In the first combination we see that twelve of the year-classes listed have at their 3.3 stage given catches belonging to the same class as the corresponding parent generation, that three year-classes at the same stage have given a smaller yield than the parent generations and two year-classes have given a better yield. According to this combination the *three year-classes which in the catch classification fell into a lower class than their parent generations have been subject to effective fishing at the mielnica stage in the southern parts of the Baltic Sea* (in Poland) *or at least they have lost a rather large number of individuals, whereas the two year-classes which were in a catch class higher than their parent generations have not suffered a heavy loss at the mielnica stage.* Year-classes which have descended from the classes of their parent generations were 1917/1918, 1921/1922 and 1922/1923 and those which have ascended to a higher class are 1926/1927 and 1929/1930. The mielnica catch of the first-mentioned year-classes in the Polish area was, calculated in thousands, 107·3, 56·7 and 77·6 individuals, and of the latter 22·8 and 7·6 individuals.

The year-class 1929/1930, the mielnica catch of which was the last-mentioned low figure of 7,600 fish has as a matter of fact risen from class c of its parent generation to class a for the older fish.

The second combination gives a slightly different picture. The first year-class 1917/1918 has been removed and the year-class 1934/1935 has been brought into the table. According to this table the year-classes 1921/1922, 1922/1923, 1926/1927 and 1929/1930 have shown a change from their original catch groups. Nevertheless the changes which these year-classes have undergone acquire a somewhat different position in the second table. The year-class 1922/1923 suffered a smaller loss of individuals at the mielnica-stage in the Polish waters than was the case according in the first combination, or 56·7 thousand instead of 77·6 thousand. As to the year-class 1926/1927 the yield at the stage 3·3 rose from class *c* of the parent generation to class *b*, although according to the second combination it was subjected to a considerable catch at the mielnica-stage in Polish waters; the mielnica catches of 1930 comprised 42·1 thousand fish. According to this combination the transition of the year-class 1929/1930 from class *c* of its parent generation to class *a* occurred in spite of the fact that the mielnica yield in the Polish waters in 1933 approached the mean yields, comprising 30·3 thousand fish. The descent of the year-class 1921/1922, from class *a* of its parent generation to class *b*, was not, according to this combination, affected to any great extent by mielnica fishing in the Polish waters of the southern part of the Baltic, for the catch there was only 13,000 fish.

Because of the differences shown in the two combinations I think *that the first one gives a clearer and at the same time a perfectly uniform picture of the relation of the mielnica fishing in the Polish waters to the catches made in Finland two years later and to the respective parent generation.* At the same time we find that the mielnica for the most part represent the phase A.1 while individuals in the phase A.+ are in the minority. This would suggest that fishing for the mielnica takes place chiefly either in the winter or in the spring or generally in the first part of the year.

Finally, I have prepared the following summary which perhaps may help in eliciting the causes of the transitions of the catch groups in the salmon stock.

1. Year-classes rising from their periods to a higher catch class.

(*a*) *Year-class 1914/1915*: transition from class *c* to class *a* (1921). Post-spawning time — autumn and early winter — mild (total of degrees of frost, 939° C).

The water-level conditions during the period of incubation very favourable in the Oulu River, evidently similar in the Kemi River (l. c. p. 94).

No information on the mielnica catches in the southern parts of the Baltic Sea.

(*b*) *Year-class 1929/1930*: transition from class *c* to class *a* (1936).

Autumn and winter exceptionally mild (total of degrees of frost in autumn and early winter, 68° C; in winter and spring, 505° C; grand total, 571° C).

Water-level conditions in autumn and winter favourable in the Kemi River, favourable in the Oulu River, although to a lesser extent; in the Tornio River perhaps favourable rather than bad but difficult to estimate (cp. diagrams in Appendices.)

The yield of mielnica in Poland (1934) very poor, only 7·5 thousand. (In this and the next case the comparison is on the basis of the first combination above).

(*c*) *Year-class 1926/1927*: transition from class *c* to class *b* (1933).

Autumn and winter fairly cold (total of degrees of frost, 448° C and 778° C; grand total, 1226° C).

Water-level conditions during the autumn and winter in the Oulu River favourable, in the Kemi River relatively favourable and even in the Tornio River probably fair (cp. diagrams in Appendices).

The yield of mielnica in Poland (1931) relatively small: 22·8 thousand.

(*d*) *Year-class 1935/1936*: transition from class *b* to class *a* (1942).

Autumn and the beginning of winter exceptionally mild (total of degrees of frost, 136° C), winter rather severe (total of degrees of frost, 1048° C; grand total, 1186° C).

The water-level conditions in the Oulu River favourable, in the Kemi River apparently unfavourable, in the Tornio River doubtful, but perhaps relatively favourable (cp. diagrams in Appendices).

No information on mielnica fishing (1940)— probably very small due to the war.

2. Year-classes which have descended from their period to a lower catch class.

(*a*) *Year-class 1922/1923*: transition from class *a* to class *c* (1929).

Period of incubation — autumn and winter — rather cold (total of frost degrees, 468° C, and 780° C; grand total, 1248° C).

Water-level conditions in the Oulu River unfavourable, but in the Kemi River favourable (cp. diagrams in Appendices).

The yield of mielnica in Poland (1927) very great, 77·6 thousand.

(*b*) *Year-class 1921/1922*: transition from class *a* to class *b* (1928).

Autumn and winter cold (total of degrees of frost, 497° C and 878° C; grand total, 1375° C).

Water-level conditions in the Oulu River unfavourable, but in the Kemi River they seemed favourable (cp. diagrams in Appendices).

The yield of mielnica in Poland (1926) good, 56·7 thousand.

(*c*) *Year-class 1917/1918*: transition from class *b* to class c (1924).

Autumn and winter must be considered normal (total degrees of frost, 286° C and 827° C or grand total, 1113° C).

Water-level conditions in the Oulu River favourable, in the Kemi River favourable.

In Finland legal and partly illegal fishing was practised during spawning period due to the hard times.

The yield of mielnica in Poland (1922) extremely good — the highest of the years 1922—1938 — or 107·3 thousand.

(*d*) *Year-class 1937/1938*: transition from class *b* to class *c* (1944).

Autumn and early winter usual (total degrees of frost, 305° C), late winter mild (total degrees of frost, 487° C; grand total, 793° C).

Water level conditions in the Oulu River favourable, in the Kemi River "unfavourable to a small extent" (cp. diagram in Appendices).

No information on the mielnica yield.

The cases dealt with indicate that several factors can sometimes be at work simultaneously to bring about the transition from one catch group to another. Some factors, as for instance different water-level conditions during the period of incubation, may sometimes have an effect in opposite directions.

I have not taken into consideration in this chapter the possibility that the ratio, which I have supposed to be normal, between the yield and the number of spawning fish may change quite exceptionally because of a sudden great increase or decrease in fishing — for instance as a result of war. In the former case the number of spawning individuals would of course be diminished: I have made a note of this occurrence with respect to the year-class 1917/1918 — and in the latter case again the number of salmon which are heading for the rivers in order to spawn would greatly increase; the latter phenomenon explains the considerable increase in the yield obtained from the Gulf of Bothnia area in the year 1945 for instance.

The next question is: What effect has artificial propagation, as practised in northern Finland, had upon the stock of salmon.

The collection and hatching of eggs has been carried out in the Oulu River since the autumn of 1908 and in the Kemi River since the autumn of 1926; the first fry were consequently put into the former river in the spring of 1909 and in the latter in the spring of 1927. This work has been continued in both rivers without interruption until the spring of 1940, when it came to a standstill, except for the winter 1943/1944 in the Oulu River. In the spring of 1922 no fry was planted in this river. The total number of fry planted in the Oulu River was 6,277,500 (in the years 1909—1944) and of parr 93,400 (in the years 1929—1934, 1939 and 1940). The total number of fry planted in the Kemi River was 7,865,000 and of parr 295,300 (in the years 1927—1940) and in addition a small number of one-year-olds (3550 in the years 1928 and 1929) and two-year-olds (2049 in 1929). The number of salmon planted each year has, however, varied greatly.

In Table 20 the salmon, which were planted are grouped in year-classes. Thus classified the significance of the plantings can be estimated in the light of the relation of each year-class to its parent generation and of its importance in contributing to the catches.

In some years a total of over a million young salmon have been planted in the Kemi and Oulu Rivers. The years in which this considerable number of young salmon were bred are those in which the parent generation (or more correctly stated the group A.3) was in class *a* or class *b*. Only once, in the autumn of 1929, was as many as 820 thousand young fish obtained for planting from a parent generation belonging to class *c*. The second largest number of young fish came from class *c* in the autumn of the years 1931 and 1932 (506·1 and 434·7 thousand). This fact in the first place gives support to the hypothesis made in the beginning of this report, that when the yield is greater than usual, or on the plus side, a greater number of salmon than usual are to be found in the river during the spawning period and vice versa. On the other hand this fact shows that the extent of the hatching and planting is chiefly dependent upon the class of the catch-group in the respective years.

The transition of the frequency of a year-class from a lower to a higher class has been observed in only five cases; the planting of a considerable number of fry occurred only in two of these cases: in the year-class 1929/1930, 820,000 and in the year-class 1935/

Table 20. The Relation of the Year-Classes to the Periods and the Liberations of Fry and Parr.

Year-Classes	The Number of liberated Fry (in thousands)			The Number of liberated Parr (in thousands)		
	Kemi River	Oulu River	Total	Kemi River	Oulu River	Total
a. Year-classes, moved upwards from Periods:						
1. From Class *c* to Class *a*:						
1914/1915→1921	—	104·4	104·4	—	—	—
1929/1930→1936	680·0	140·0	**820·0**	20·8	10·4	31·2
2. From Class *b* to Class *a*:						
1915/1916→1922	—	263·0	263·0	—	—	—
1935/1936→1942	605·5	478·0	**1083·5**	—	—	—
3. From Class *c* to Class *b*:						
1926/1927→1933	70·5	70·5	141·0	—	—	—
b. Year-classes united to their Periods:						
1. remaining in Period *a*:						
1920/1921→1927	—	200·0	200·0	—	—	—
1927/1928→1934	753·0	318·0	**1071·0**	26·2	—	26·2
1934/1935→1941	904·7	445·0	**1222·7**	26·2	—	26·2
1936/1937→1943	853·3	400·0	**1253·0**	24·6	—	24·6
2. remaining in Period *b*:						
1916/1917→1923	—	42·0	42·0	—	—	—
1923/1924→1930	—	121·0	121·0	—	—	—
1928/1929→1935	771·7	129·5	**901·2**	20·3	11·5	31·8
1930/1931→1937	607·0	510·0	**1117·0**	18·8	11·5	30·3
1933/1934→1940	676·0	487·0	**1163·0**	19·9	9·8	29·7
3. remaining in Period *c*:						
1918/1919→1925	—	206·0	206·0	—	—	—
1919/1920→1926	—	446·0	446·0	—	—	—
1924/1925→1931	—	65·5	65·5	—	—	—
1925/1926→1932	—	119·5	119·5	—	—	—
1931/1932→1938	427·5	78·6	506·1	21·9	10·5	32·4
1932/1933→1939	323·6	111·1	434·7	16·5	10·8	27·3
c. Year-Classes moved downwards from Periods:						
1. From Class *a* to Class *b*:						
1921/1922→1928	—	—	—	—	—	—
2. From Class *a* to Class *c*:						
1922/1923→1929	-	269·0	269·0	—	—	—
3. From Class *b* to Class c:						
1917/1918→1924		112·7	112·7	—	—	—
1937/1938→1944	392·7	517·0	**909·7**	28·9	—	28·9
d. Year-Classes the frequency of which cannot yet be estimated:						
1. Originally from Class *c*:						
1938/1939→(1945)	331·0	328·0	659·0	29·5	19·5	49·0
1939/1940→(1946)	465·2	197·3	662·5	25·3	9·5	34·8

In the years 1941—1944 neither fry nor parr were liberated in the Kemi River. In the Oulu River 87,000 fry were liberated in the spring of 1944, none in the years 1941—1943.

1936, 1,083,500. There is no reason for believing that these plantings have contributed to any great extent to the large catches in these years; on pages 48—49 temperatures and water-level conditions were stated to be the factors which most probably were favourable. Three other transitions of a year-class to a higher frequency class (1914/1915, 1915/1916 and 1925/1926) occurred when the number of fry planted was very modest (only 104—263 thousand).

The year-class 1937/1938 is among those which descended into a lower class. The addition from the hatchery was almost a million fish (909,700 fry and 28,900 parr). Although this number was so large it did not prevent the descent to a lower class.

I cannot find in Table 20 any indication that the output of fry or young salmon from the hatcheries has had any effect on the frequency of the different year-classes. On the contrary, increases and decreases follow the changes occurring in the numbers of the parent generations.

The large output of fry attracts attention — it amounts to hundreds of thousands and millions. The real value of these numbers, however, depends upon the value of the individual fry and the parr to the adult stock. It cannot be determined exactly, although a certain indirect estimate can be made. The basis for such estimate is taken from the theoretical loss figures, which primarily have been calculated for insects but later also for fish[1]).

The calculations are based on the one hand on the greatest possible number of descendants, i. e., the number of eggs, and on the other hand the natural mortality causing no more than two individuals from each pair of parents to reach maturity. To obtain the loss percentage a very simple formula is used: $\frac{100\,(a-b)}{a}$ in which a indicates the number of eggs and b the number of parents, i. e., two. As the mean number of eggs of the salmon is approximately 14 to 15 thousand[2]), we get a loss percentage of 99,986 when we use the formula to produce the result of two full grown salmon; in other words out of 14,000 eggs 13,998 would have to be destroyed either as eggs or fry or at a more advanced stage before sexual maturity If 50 % of the eggs were to be unfertilized or were destroyed before the fry were hatched, 7000 fry would be born; of these only two would develop into mature individuals; thus the loss would still be 99,972 % and the number of individuals reaching maturity 0·03 %[3]). Calculating on the basis of the latter percentage three mature salmon develop from 10,000 fry, thirty from 100,000 and three hundred from 1,000,000. Since such a heavy loss prevails, the planting of a million fry may be considered to be a favourable measure to the stock of salmon, but for a state, as, for instance, Finland, whose share in the catch may be estimated as only one fifth of the total catch this measure in itself cannot be economically profitable. In the author's personal opinion sufficient protection during the migration upstream and at the spawning period is better for the stock of salmon than hatching eggs and planting fry[4]). Further the act of taking eggs and milt disturbs the natural spawn in its preliminary stages.

[1]) Fischer, Erich. 1932. Die Wirkung des Fanges untermassiger Fische auf den Bestand. Rapp. et Proc.-Verb., Vol. No. 80, II, p. 8—9.

[2]) According to the observations made in the Kemi River (Järvi, T. H.: Suomen Kalastuslehti, 1932, p. 21—27).

[3]) The following consideration attach to the above-mentioned percentage—more exactly calculated at 0·028 %.

[4]) The calculations for mortality given above have been made on the basis that the proportion of spawning salmon to offspring remains the same. This rate of mortality indicates the lowest limit; if it falls still further it leads to the extinction of the stock. But since the stock of salmon is taxed—and indeed very heavily taxed—before the individuals have had any possibility of breeding the percentage of salmon developing to maturity must be considerably above the above-mentioned minimum. How much higher the percentage may be the author cannot venture to suggest. In this connection the following facts may be mentioned.

A dam was built for a power station 9 km. from the mouth of the Lagan River in southern Sweden. This dam blocks the ascent of the salmon to their former breeding grounds but fishing is continued at the mouth of the river. In order to maintain the stock a considerable amount of fry and young salmon reared in ponds have been planted in the river. An estimate of the proportion of young fish planted to the number of salmon caught has shown that the percentage of the latter has been less than—and generally considerably less than —0·05 %. Tore Almstedt (Laxyngeldammarna vid Lagan. Skrifter utg. av Södra Sveriges Fiskeriförening, 1944, p. 60), makes the following statement: "Although the small catches depend to a certain extent upon the methods of fishing the above-mentioned figure is based on the largest catch in the river."

In 1921 J. P. Jacobsen and A. C. Johansen ("On the Causes of the Fluctuation in the Yield of some of our Fisheries, I. The Salmon and Sea Trout Fisheries", Medd. Komm. Havunders., Ser. Fiskeri, Bd. VI: 5), estimated the results of the planting of young salmon and sea trout in the Gudenaa. The above-mentioned investigators came to the conclusion that from 10,000 fry planted 14 adult salmon or 0·14 % and from 10,000 parr planted 19 adult fish or 0·19 % ascended the river or came into the fjord at the mouth of the river. In 1920 the Gudenaa was closed (at its mouth) by a dam built for a power station. Later it has been found (Erik M. Poulsen: "Nye Undersøgelser over Gudenaaens Lakse og Havørredbestand", Beretn. biol. Stat., 40, 1935, p. 10), that salmon fishing in this river has completely ceased in spite of the construction of a fish-ladder there; in the years 1929 to 1931 inclusive not a single salmon was caught and in the years 1932 to 1934 inclusive only 8. Nevertheless the stock of sea trout has been preserved, although the catches made in the river and fjord, have diminished to about one half of previous catches; to some extent the reason for this may have been a decrease in fishing intensity.

5. Statistics of Catch and the Periods in the Baltic.

It is clear that catch statistics are an exellent source of information on the fluctuations in the stocks of fish. Their biological value depends not only upon their accuracy and authenticity but also, particularly as regards the stock of salmon, upon the fact that other information is given in addition to the total weight of the different kinds of fish caught.

The general catch statistics collected and published in Finland must, I regret to say, still be regarded as lacking in precision and antiquated, because they are not based upon proper book-keeping and compulsory reports but mostly upon local estimates, which have not been made with sufficient care. This fact can be observed from Table 21. I have drawn up this table by collecting the reports sent to the Central Statistical Bureau from different localities for the years 1936—1944. But the localities where the yield has been below 100 kg. have been omitted;

in some cases the amount reported has been added to that of a neighbouring locality. The character of the reports for the years 1936—1944 has improved in comparison with those of earlier years in that the yield of salmon has been reported separately from that of sea trout, although in the reports of the Central Statistical Bureau they have been published together.

Table 21 shows that our salmon fishing is chiefly centered in the northern part of the Bothnian Bay — about 67 to 85% — and that the importance of the Gulf of Finland region has consistently decreased, partly on account of the cession in 1940 of territory to Soviet Russia. Table 21 also shows that the salmon yield from Saaristomeri (Skärgårdshavet) in the Archipelago to the east of Åland has merited attention in certain years. Whereas during the years in question a weight of salmon, reported from any parish in Åland did not exceed 150 kg. Therefore Åland has been omitted altogether.

The statistics given in Table 21 have not been used in dealing with questions regarding the periodicity of the stock of salmon in this report because of their lack of precision and reliability. They lead nevertheless to the following estimates: the years 1936, 1942 and 1943 were good years (Table 1), the years 1938 and 1939 bad and year 1940 either bad or average.

As a statistical foundation for estimating the catches from the northern area of the Bothnian Bay (the largest centre of the salmon fishery of Finland) the information collected by the Bureau of Fishing Investigation from the fishing grounds owned by the Finnish State in this region has been used. The statistics are stated daily and consist of the number of salmon caught and their weights grouped in weight-classes. For the years 1936—1944 they are summarized in Tables 22 and 23; the information regarding the years 1921—1935 has been published earlier (l. c. pp. 84—85).

An effort was made to draw the lines between the weight-classes so that each of the life-cycle groups A.1+, A.2+, A.3, A.4 and A.5 would have its own weight-class although those salmon which verged on the line fell into adjacent classes. Also the previously spawned salmon or those of group G, (which are not numerous) add to the number of individuals in the higher weight-classes. In all the life-cycle groups the value of A is two or four years, sometimes five, but in most cases it is three years.

Difficulties have arisen in determining the limits between the weight-classes. In the years 1921—1935 the following classification was used:

(*a*) < 3·0 kg.
(*b*) 3·5 to 7·0 „
(*c*) 7·5 „ 13·0 „
(*d*) 13·5 „ 19·0 „
(*e*) > 19·0 „

From the year 1936 it has been:

(*a*) < 3·5 kg.
(*b*) 4·0 to 8·5 „
(*c*) 9·0 „ 14·0 „
(*d*) 14·5 „ 19·0 „
(*e*) > 19·0 „

The weight statistics for the years 1936—1944 comprise a total of 109,231 salmon weighing 805,821 kg.; thus the mean weight is 7·38 kg. They further embrace the following percentages of the total yield (see the summary of Tab. 21) from the northern area of the Bothnian Bay (or the regions 1—8):

1936	67·0%	1939	60·3%	1942	63·3%
1937	60·7%	1940	76·2%	1943	42·4%
1938	44·1%	1941	65·0%	1944	42·9%

or an average of 56·7% for the years 1936 to 1944 inclusive.

Since the ultimate purpose of the statistics given in Tab. 22 was not the classification as to weight but as to age, i. e., the division into year-classes, of the salmon caught as well as of the stock of salmon, the question arises: To what extent has this purpose been realized and what factors must be taken into consideration when using the statistics in this way. In my earlier report I have already dealt with the errors which arise from the fact that the smolt age varies and that the previously spawned salmon belong to different weight-classes, and I have made changes from one weight-class to another on the basis of the percentages which — according to scale samples — prevailed among the smolts of various ages and between the salmon making their first ascent and those which had previously ascended. In certain cases the changes could be checked (l. c., pp. 80—81). But even if the results were satisfactory in some cases, they were less so in others. In this report, therefore, the calculations are omitted.

The most important weight-class was that of 7·5—13·0 kg. (later 9·0—14·0 kg.) since it represents (Tab. 1, p. 10) the six-year-old salmon, even if the seven-year-olds and sometimes five-year-olds belong to the same class (previously ascended salmon were disregarded).

The degree of the inaccuracy of this method is dealt with on p. 8 as regards the years 1921—1935 and on p. 14 as to the years 1936—1941 (cf. also Table 10, p. 33).

However, the salmon caught in the years 1942, 1943 and 1944 must be treated separately in this respect. The scale samples of the salmon caught during the period 1942—1944 have throughout all regions shown a restricted rate of growth in comparison with the years 1921—1941. Consequently the weight-classes determined in 1936 do not correspond with the limits which I formerly determined for the life-cycle classes.

A considerable decrease since 1941 in the mean size of the different life-cycle class groups, particularly

(Cont. page 59)

Table 21. Statistical Information on the Catches of Salmon (in kg.) during the Period 1936—1944.

A. The Baltic Sea.

		1936	1937	1938	1939	1940	1941	1942	1943	1944
1	*Tornio Region*:									
	Alatornio (sea)	26.460	25.100	24.000	25.500	35.000	6.000	31.000	28.000	31.000
	Alatornio (river)	21.000	9.000	9.000	20.000	10.000	30.000	12.000	10.500	12.000
	Karunki	3.400	1.900	695	1.250	370	690	3.360	7.650[1])	3.750
	Ylitornio	1.000	1.200	500	150	150	200	400	—	3.500
	Turtola	100	20	15	10	50	75	150	420[2])	350
	The whole Region	51.960	37.220	34.210	46.910	45.570	36.965	46.910	46.570	50.600
2	*Kemi Region*:									
	Kemi (sea)	20.000	18.000	15.000	16.000	16.500	25.000	20.000	45.000	22.000
	Kemi (river)	2.000	1.200	600	1.200	500	400	200	240	300
	Tervola	1.590	850	550	540	162	120	120	—	8.500
	Kittilä	750	600	400	360	271	200	50	700	—
	Kemijärvi, Savukoski	130	50	90	—	90	—	—	—	195
	The whole Region	24.470	20.700	16.610	18.100	17.523	25.720	20.370	45.940	30.995
3	*Simo Region* (sea)	40.000	35.000	28.000	22.505	38.000	49.615	50.000	43.000	47.700
4	*Kuivaniemi* (sea)	13.000	14.000	4.000	2.000	9.000	10.000	25.000	50.000	55.300
5	*Ii Region*:									
	Ii (sea)	9.000	6.000	4.000	3.500	10.000	8.000	22.000	20.000	21.000
	Ii (river)	2.000	2.000	1.835	2.410	2.500	2.300	8.100	10.145	1.923
	Pudasjärvi	1.500	200	92	100	40	40	200	250	200
	Taivalkoski	100	100	100	200	200	1.000	750	750	1.000
	The whole Region	12.600	8.300	6.027	6.210	12.740	11.340	31.050	31.145	24.123
6	*Haukipudas* (sea)	5.000	4.100	3.200	3.600	3.800	7.600	7.200	7.700	6.200
7	*Oulu Region*:									
	Oulunsalo (sea)	1.800	1.000	200	70	250	110	52	41	—
	Oulu, Oulu river	3.750	902	504	786	115	3.034[3])	3.239[3])	4.350[3])	8.300[3])
	Muhos	14.150	7.535	4.143[3])	4.050	2.640[4])	—	—	170	—
	Utajärvi	500	456	200	186	200	—	55	210	1.250
	The whole Region	20.200	9.893	5.047	5.092	3.205	3.144	3.346	4.771	9.550
8	*Hailuoto* (sea)	1.800	1.400	1.400	1.000	1.500	1.300	1.000	1.000	1.000
9	*Raahe Region* (sea):									
	Siikajoki	400	400	500	200	1.000	500	1.500	2.500	3.000
	Saloinea, Pattijoki, Raahe	70	65	75	60	65	120	77	116	680
	Pyhäjoki	500	250	50	—	—	250	246	200	320
	Kalajoki	1.800	1.600	937	1.100	755	700	864	1.615	1.500
	The whole Region	2.770	2.315	1.562	1.360	1.820	1.570	2.687	4.431	5.500
10	*The southern Region of the Bothnian Bay* (sea):									
	Himanka	215	260	200	220	260	300	300	350	200
	Lohtaja	200	200	180	—	100	100	30	400	100
	Kälviä	150	160	150	100	200	150	150	200	—
	Larsmo	3.200	3.000	3.000	2.500	2.500	2.500	2.700	2.500	3.000
	Pietarsaari	100	260	160	100	165	500	500	400	—
	Uusikaarlepyy	700	420	350	350	300	700	590	200	650

[1]) The amount also consists of the catches taken in Ylitornio in the year 1943.
[2]) The catches are reported from Muonto not from Turtola.
[3]) Comprises the catches taken by the Fishing Company of the Oulu River.
[4]) During the years 1936—1940 fishing was mainly carried out in Muhos in traps constructed in the Pyhäkoski Rapids (Leppiniemi, Hietaniemi, Oksa, Huoseusniemi, of which the first-mentioned was most abundant. When the erection of the Merikoski weir in the town of Oulu had progressed so far in the year 1941 that it stopped the ascent of the majority of salmon higher up the river, the fishing in Muhos was transferred to Merikoski.

Table 21 (continued).

	1936	1937	1938	1939	1940	1941	1942	1943	1944
Munsala	1.650	1.950	2.450	1.800	1.200	500	270	500[1])	350
Vörå	400	—	1.800	—	—	1.000	2.000	3.000	2.000
Koivulahti, Mustasaari	1.400	(100)	1.000	500	—	750	300[1])	—	570[1])
Björköby	400	200	100	200	—	—	—	—	—
The whole Region:	8.415	6.550	9.390	5.770	4.725	5.500	6.840	7.550	6.870
11 *The Gulf of Bothnia*, Vaasa Region (sea):									
Raippaluoto	2.000	1.500	500	1.200	1.000	2.000	4.000	2.000	3.000
Solv	850	815	510	240	—	700	1.600	900	600
Bärgö	150	200	200	50	150	300	400	600	400
Malax	100	200	—	—	—	—	—	—	—
Korsnäs	190	200	230	200	230	180	—	—	90
Närpes	600	173	700	400	500	800[2])	725[2])	—	300
Kaskinea	2.750	2.750	2.010	2.000	1.800	3.100	2.450	4.000	2.350
Kristiina	466	174	133	131	95	456	314	253	154
Lappfjärd	300	300	200	200	200	—	—	—	200
Sideby	300	300	300	300	400	400	400	400	400
The whole Region	7.706	6.614	4.783	4.721	4.375	7.936	9.889	8.153	7.494
12 *The Gulf of Bothnia*, Satakunta, Varsinais Suomi:									
Merikarvia	180	125	500	460	300	500	500	700	250
Ahlainen	100	170	180	190	150	280	180	450	340
Pori (country)	5.000	4.000	4.000	3.500	3.300	—	3.000	3.000	3.000
Pori (town)	2.900	2.530	—	4.420	2.350	350	600	1.800	742
Ulvila	—	1.380	400	2.395[3])	—	576	868[4])	660	120
Luvia	2.800	2.200	2.000	1.700	2.000	—	1.500	6.000	4.000
Eurajoki	1.100	200	1.000	1.200	—	210	2.000	—	8.500
Rauma	305	302	115	686	309	339	170	320	118
Pyhämaa, Pyhäranta	360	430	375	415	460	339	2.000	—	55
Kalanti	75	90	150	138	—	—	—	—	—
The whole Region:	12.820	11.427	8.720	15.089	8.869	2.597	10.818	12.930	17.125
13 *Archipelago of Turku*:									
Lokalahti	—	150	140	—	40	400	—	—	150
Kustavi, Iniö, Velkua, Taivassalo	240	300	408	315	151	225	—	—	390
Rymättylä	—	350	550	3.000	5.000	1.000	1.500	550	820
Korpo	—	150	120	310	130	—	285	—	75
Pargas, Piikkiö	700	580	600	600	100	500	200	250	1.883
Vestanfjärd, Dragsfjärd, Karuna	85	185	220	710	600	265	120	980	470
Kemiö	400	300	300	—	300	400	350	325	300
Särkisalo, Perniö	50	100	140	550	610	400	—	—	300
The whole Region[5])	1.475	2.115	2.478	5.485	6.931	3.188	2.455[6])	2.105[6])	4.388
14 *The Gulf of Finland*, Uusimaa:									
Bromarf	—	300	400	350	400	400	500	1.000	800
Tenala, Hanko	—	640	520	—	100	—	200	—	100
Tammisaari (Ekenäs)	—	200	200	300	200	—	200	—	115
Degerby, Siuntio, Kirkkonummi	—	270	150	260	433	460	100	150	155
Porvoo (Borgå)	—	132	70	85	175	110	150	130	175
Pernaja	—	350	—	—	—	—	—	—	—
Ruotsinpyhtää	—	950	270	—	164	120	—	100	110
Rivers	—	60	60	48	—	89	87	—	92
The whole Region	(3.200)	2.982	1.800	2.388	1.512	1.177	1.302	1.770	1.547

[1]) The yield from Maksmo.
[2]) In the years 1941 and 1942 certain small catches from other parishes were added to the yield of Närpes.
[3]) It comprises also 35 kg. caught in Nakkila.
[4]) It comprises also 200 kg. reported from Harjavalta.
[5]) Only 100 à 150 kg. catches were reported from Åland and were therefore not included in this survey.
[6]) The smaller catches in the years 1942 and 1943 were not registered separately.

Table 21 (continued).

		1936	1937	1938	1939	1940	1941	1942	1943	1944
15	*The Gulf of Finland*, Kymi Region:									
	Pyhtää (sea)	1.800	1.500	1.200	500	800	700	1.508	350	—
	Pyhtää (river)	550	—	350	135	50	—	—	—	300
	Haapasaari	217[1])	125[2])	30	160	—	—	800	850	150
	Kymi (sea)	3.000	4.200	3.000	2.000	1.200	600	100	600	400
	Kymi (river)	1.800	1.800	1.500	1.500	640	150	350	850	250
	Vehkalahti	285	270	90	50	100	150	440	400	600
	Virolahti	1.157	1.042	681	600	—	500	1.000	1.500	500
	The whole Region:	8.809	8.937	10.001	4.945	2.790	2.100	4.148	4.550	2.200
16	*The Gulf of Finland*, east Region:									
	Säkkijärvi	550	470	460	460	1940—1941		400	400	600
	Viipuri (country)	150	100	150	150	According to the		400	—	
	Koivisto	2.650	2.150	2.500	2.150	treaty of peace in		330	—	
	Kuolemajärvi	2.000	2.500	2.550	2.550	Moscow (1940) the		400	500	fight-
	Uusikirkko	1.000	1.000	2.000	2.000	Region belonged		2.860	650	grounds
	Terijoki	3.200	1.800	1.300	—	to the Soviet-		·	—	—
	Seiskari	—	100	250[3])	200	Union.		·	·	–
	The whole Region	9.550	8.120	9.210	(7.510)	—	—	4.390	(1.550)	600
B.	**The Arctic Sea Area**									
	Petsamo (sea)	20.000	21.747	25.000	19.500	—	50.000	5.000	3.950	—
	Petsamo (river)	800	1.200	1.000	1.000	2.000	1.500	1.500	1.200	—
	Utsjoki	1.500	3.400	3.600	3.800	5.000	3.000	2.800	2.500	—
	Inari	200	150	200	250	400	300	300	400	—
	The whole Region	22.500	26.497	29.800	24.550	7.400	54.800	9.600	8.050	—

Summary from the Area 1—16 (Baltic Area):

	Weight in kg.									
1— 8	Bothnian Bay, northern Reg.[4])	169.030	130.613	98.494	105.417	131.338	145.684	184.876	230.126	225.468
9—10	Bothnian Bay, southern Reg..	11.185	8.865	10.952	7.130	6.545	7.070	9.527	11.981	12.370
11—13	Gulf of Bothnia and Archipelag.	22.001	20.156	15.981	25.295	20.175	13.721	23.162	23.188	29.007
14—16	Gulf of Finland	21.559	20.059	21.011	14.843	(4.302)	(3.277)	9.884	(7.870)	(4.347)
	Total ...	**223.775**	**179.693**	**146.438**	**152.685**	**162.360**	**169.752**	**227.405**	**273.165**	**271.192**
	Percentages:									
1— 8	Bothnian Bay, northern Reg..	75·6	72·7	67·3	69·0	80·9	85·8	81·3	84·2	83.1
9—10	Bothnian Bay, southern Reg..	5·0	4·9	7·5	4·7	4·0	4·2	4·2	4·4	4.6
11—13	Gulf of Bothnia and Archipelago	9·8	11·2	10·9	16·6	12·4	8·1	10·2	8·5	10.7
14—16	Gulf of Finland	9·6	11·2	14·3	9·7	(2.7)	(1·9)	4·3	(2·9)	(1.6)
	Total ...	100	100	100	100	100	100	100	100	100

[1]) The 57 kg. caught at Suursaari and Tytarsaari are included.
[2]) The yield from the waters of Suursaari and Tytarsaari — no report from Haapassari.
[3]) Including 50 kg. from Lavansaari.
[4]) An association called the League of Fishing Corporation (in the Oulu administrative district), which represents farmers owning fishing grounds in the Bothnian Bay area (from Tornio to Oulu and Utajärvi), has annually estimated the results of salmon, sea trout and lavaret fishing in this area and has published them in their yearly reports. The figures regarding salmon fishing are as follows:

1936: yield c. 150 000 kg. valued 3.300 000 mk à 22 mk per kg.
1937: yield c. 85 000 kg. valued 2.650 000 mk à 31 mk per kg.
1938: yield c. 60 000 kg. valued 1.920 000 mk à 33 mk per kg.
1939: yield c. 60 000 kg. valued 2.100 000 mk à 35 mk per kg.
1940: yield c. 122 000 kg. valued 4.635 000 mk à 38 mk per kg.
1941: yield c. 152 000 kg. valued 9.890 000 mk à 65 mk per kg.
1942: yield c. 155 000 kg. valued 13.330 000 mk à 86 mk per kg.
1943: yield c. 150 000 kg. valued 14.060 000 mk à 90 mk per kg.
1944: yield c. 148 000 kg. valued 14.800 000 mk à 95 mk per kg.

Table 22. Catch Statistics for various Fishing Grounds of the northern Bothnian Bay.

Number of Salmon divided into Weight-Classes (l. c., Table 28 A, pp. 84—85.)

Weight-Classes	Tornio Region		Kemi Region		Simo Region								
	Tornio Kiviranta	Alatornio Sea	Köngäs and Muurola	Kemi Sea	Maksniemi	Simoniemi	Simon Kylä	Kuivaniemi Region (Sea)	Ii Region (Sea)	Haukipudas Region (Sea)	Oulu River	Total	Percentage
1936													
> 19·0	38	4	2	1	5	—	1	7	6	—	11	**75**	0·6
14·5—19·0	259	104	44	110	125	97	29	54	62	12	297	**1193**	9·7
9·0—14·0	858	243	251	817	581	607	683	946	715	27	937	**6665**	**54·1**
4·0— 8·5	858	191	115	403	617	287	234	399	343	18	138	**3603**	29·3
≦ 3·5	252	27	6	122	93	49	14	70	45	20	79	**777**	6·3
Total ...	2265	569	418	1453	1421	1040	961	1476	1171	77	1462	**12313**	100·0
1937													
> 19·0	7	8	3	6	5	—	3	6	4	1	8	**51**	0·6
14·5—19·0	64	60	33	57	99	16	38	70	60	7	108	**612**	7·5
9·0—14·0	148	281	121	603	982	637	697	715	837	23	338	**5382**	**65·6**
4·0— 8·5	60	114	51	155	412	165	152	194	214	16	43	**1576**	19·2
≦ 3·5	62	45	4	107	88	40	37	76	84	22	20	**585**	7·1
Total ...	341	508	212	928	1586	858	927	1061	1199	69	517	**8206**	100·0
1938													
> 19·0	1	5	3	8	—	1	1	2	3	—	5	**29**	0·5
14·5—19·0	15	27	53	43	5	19	13	10	29	5	81	**300**	4·7
9·0—14·0	60	156	219	331	625	208	127	124	252	17	219	**2338**	37·0
4·0— 8·5	83	70	127	206	233	168	130	181	197	11	113	**1519**	24·0
≦ 3·5	393	166	19	254	508	242	80	108	154	27	183	**2134**	33·8
Total ...	552	424	421	842	1371	638	351	425	635	60	601	**6320**	100·0
1939													
> 19·0	1	10	1	2	—	—	1	—	1	—	5	**21**	0·2
14·5—19·0	46	32	27	32	6	9	5	4	11	7	8	**187**	1·6
9·0—14·0	112	189	172	360	1066	114	137	79	355	12	191	**2787**	24·5
4·0— 8·5	219	302	161	552	747	563	490	329	174	5	113	**3655**	32·2
≦ 3·5	1757	139	100	719	1103	268	165	203	114	10	138	**4716**	41·5
Total ...	2135	672	461	1665	2922	954	798	615	655	34	455	**11366**	100·0
1940													
> 19·0	5	13	—	5	—	—	—	—	1	—	3	**27**	0·2
14·5—19·0	129	109	17	55	3	5	4	24	21	13	49	**429**	3·3
9·0—14·0	495	667	205	366	959	398	474	688	746	12	194	**5204**	39·4
4.0— 8·5	1391	496	234	611	855	522	551	666	585	11	46	**5968**	45·2
≦ 3·5	477	76	8	175	290	110	47	180	169	21	19	**1572**	11·9
Total ...	2497	1361	464	1212	2107	1035	1076	1558	1522	57	311	**13200**	100·0
1941													
> 19·0	2	5	5	3	—	—	—	2	12	1	2	**32**	0·3
14·5—19·0	64	91	53	20	—	16	40	23	53	8	29	**397**	3·5
9·0—14·0	404	1078	578	96	1684	451	733	982	1018	15	108	**7147**	**62·9**
4·0— 8·5	220	341	101	57	608	209	278	393	403	11	27	**2648**	23·3
≦ 3·5	209	146	47	20	146	99	134	181	153	2	—	**1137**	10·0
Total ...	899	1661	784	196[1])	2438	775	1185	1581	1639	37	166[5])	**11361**	100·0

[1]) No information from Valkeakari since 1940, nor from Ajoksenkrunni for 1941 and 1943. [2]) No information from the Ii River weirs (Venäjänkari, Haukka and Illi weirs) for the years 1942—1944. [3]) Only from Huituri. [4]) This includes also the yield from Ajoksenkrunni (parish of Kemi).

Table 22 (continued).

Weight-Classes	Tornio Region: Tornio Kivaranta	Tornio Region: Alatornio Sea	Kemi Region: Köngäs and Muurola	Kemi Region: Kemi Sea	Simo Region: Maksniemi	Simo Region: Simoniemi	Simo Region: Simon Kylä	Kuivaniemi Region (Sea)	Ii Region (Sea)	Haukipudas Region (Sea)	Oulu River	Total	Percentage
1942													
> 19·0	4	6	—	1	—	—	—	1	1	—	4	**17**	0·1
14·5—19·0	88	112	18	11	—	9	1	23	43	7	50	**362**	2·3
9·0—14·0	631	443	108	102	2098	407	415	475	535	12	99	**5325**	34·7
4·0— 8·5	1087	260	572	178	751	681	881	2039	1304	28	136	**7917**	**51·6**
≦ 3·5	438	105	6	26	178	138	184	337	271	13	32	**1728**	11·3
Total ...	2248	926	704	318	3027	1235	1481	2875	2154[2])	60	321[5])	**15349**	100·0
1943													
> 19·0	—	10	—	—	—	—	3	1	2	—	—	**16**	0·1
14·5—19·0	23	70	1	2	14	—	8	24	10	5	2	**159**	1·2
9·0—14·0	383	368	97	216	924	327	365	349	332	14	65	**3440**	25·2
4·0— 8·5	1199	460	314	179	2290	677	648	1451	923	15	91	**8247**	**60·5**
≦ 3·5	207	60	—	20	400	147	175	408	309	18	25	**1769**	13·0
Total ...	1812	968	412	418	3628	1151	1199	2233	1576	52	183[5])	**13631**	100·0
1944													
> 19·0	—	2	—	2	—	—	1	1	6	1	—	**13**	0·1
14·5—19·0	46	20	9	3	27	34	21	30	19	5	84	**298**	1·7
9·0—14·0	644	171	181	45	1640	425	399	498	299	31	530	**4863**	27·8
4·0— 8·5	1098	203	212	87	1417	447	480	1145	708	32	128	**5957**	34·1
≦ 3·5	1698	16	211	37	2061	501	474	974	329	46	7	**6354**	36·3
Total ...	3486	412[3])	613	174	5145[4])	1407	1375	2648	1361	115	749[5])	**17485**	100·0

[5]) Only salmon of which the scales have been examined have been taken into consideration in the catch statistics of the Oulu River beginning from 1941. The total yield (we have no information as to the division into weight-classes) was 260 salmon in 1944, 498 in 1942 (238 under 5 kg.), 838 in 1943 (349 under 5 kg.), and in 1944 1641 (325 under 5 kg.).

Appendix to Table 22. Approximate Division of Salmon into Life-Cycle Groups

on the basis of the percentages given in Table 9 (viz. 7.2, 25.9, 49.1, 9.6 and 7.4 % for A.1+, A.2+, A.3, A.4 and G respectively in 1936 and corresponding figures in the following years).
The number of the salmon in the weight-classes is given in brackets.

	1936		1937		1938		1939		1940	
G	911	—	968	—	455	—	330	—	620	—
A.5 (> 19·0 kg.)	99	(75)	148	(51)	57	(29)	23	(21)	13	(27)
A.4 (14·5—19·0 kg.)	1.182	(1.193)	862	(612)	499	(300)	136	(187)	449	(429)
A.3 (8·5—14·0 kg.)	6.046	(6.665)	4.439	(5.382)	1.593	(2.338)	1.659	(2.787)	3.511	(5.204)
A.2+ (4·0—8·0 kg.)	3.189	(3.603)	903	(1.576)	1.365	(1.519)	2.535	(3.655)	7.181	(5.968)
A.1+ (≦ 3·5 kg.)	886	(777)	886	(585)	2.351	(2.134)	6.683	(4.716)	1.426	(1.572)
	12.313		**8.206**		**6.320**		**11.366**		**13.200**	

	1941		1942		1943		1944	
G	966	—	414	—	354	—	227	—
A.5 (> 19·0 kg.)	57	(32)	15	(17)	14	(16)	17	(13)
A.4 (14·5—19·0 kg.)	659	(397)	1.074	(362)	1.758	(159)	5.857	(298)
A.3 (8·5—14·0 kg.)	6.464	(7.147)	9.226	(5.325)	9.910	(3.440)	2.465	(4.863)
A.2 (4·0—8·0 kg.)	2.204	(2.648)	4.528	(7.917)	1.009	(8.247)	7.380	(5.957)
A.1+ (≦ 3·5 kg.)	1.011	(1.137)	92	(1.728)	586	(1.769)	1.539	(6.354)
	11.361		**15.349**		**13.631**		**17.485**	

Table 23.

Catches of Salmon (in kg.) from various Fishing Grounds of the northern Bothnian Bay.

Divided into Weight-Classes.

Weight-Classes	Tornio Region	Kemi Region	Simo Region: Maksniemi	Simo Region: Simoniemi	Simo Region: Simonkylä	Kuivaniemi Region	Ii Region	Haukipudas Region	Oulu River	Total	Mean Weight, kg.
1936											
>19·0	814	68	101	—	22	149	122	20	220	**1516**	20·2
14·5—19·0	5677	2633	1937	1538	438	836	1005	178	4466	**18708**	15·7
9·0—14·0	11999	12980	5832	6006	7218	9740	7493	287	10243	**71798**	10·8
4·0— 8·5	6018	2933	3349	1422	1149	1985	2184	106	773	**19919**	5·5
≦ 3·5	415	210	213	65	26	163	121	29	140	**1382**	1·8
Total ...	24923	18824	11432	9031	8853	12873	10925	620	15842	**113323**	9·2
1937											
>19·0	314	181	109	—	59	126	84	20	170	**1063**	20·8
14·5—19·0	1844	1442	1516	249	607	1091	945	107	2160	**9961**	16·3
9·0—14·0	4920	8242	10719	7019	7572	7368	8841	252	3684	**58617**	10·9
4·0— 8·5	1025	1099	2363	761	695	986	1224	104	279	**8536**	5·4
≦ 3·5	181	230	152	64	57	152	210	43	38	**1127**	1·9
Total ...	8284	11194	14859	8093	8990	9723	11304	526	6331	**79304**	9·7
1938											
>19·0	124	225	—	23	22	40	62	—	98	**594**	20·5
14·5—19·0	708	1516	74	305	205	166	472	79	1336	**4861**	16·2
9·0—14·0	2340	5751	6609	2147	1333	1289	2601	190	2628	**24888**	10·6
4·0— 8·5	920	2151	1177	904	709	1036	1202	57	791	**8947**	5·9
≦ 3·5	990	510	1099	413	141	228	336	63	357	**4137**	1·9
Total ...	5082	10153	8959	3792	2410	2759	4673	389	5210	**43427**	6·9
1939											
>19·0	229	44	—	—	—	—	20	—	105	**398**	19·0
14·5—19·0	1290	942	104	154	77	62	177	106	132	**3044**	16·3
9·0—14·0	3489	6046	9966	1179	1424	851	3803	141	2440	**29339**	10·5
4·0— 8·5	3570	4477	4034	3263	2810	2185	1004	41	870	**22254**	6·1
≦ 3·5	3150	1478	2181	431	261	404	299	14	285	**8503**	1·8
Total ...	11728	12987	16285	5027	4572	3502	5303	302	3832	**63538**	5·6
1940											
>19·0	307	125	—	—	—	—	20	20	63	**535**	19·8
14·5—19·0	3878	991	48	80	63	375	331	186	794	**6746**	15·7
9·0—14·0	14234	5862	9959	4156	5145	7303	7880	137	2835	**57511**	11·1
4·0— 8·5	11300	4779	4108	2676	2782	3490	3197	84	281	**32697**	5·7
≦ 3·5	660	370	587	159	77	365	329	38	24	**2609**	1·7
Total ...	30379	12127	14702	7071	8067	11534	11757	464	3997	**100098**	7·6
1941											
>19·0	142	160	—	—	—	40	246	—	40	**628**	19·6
14·5—19·0	2515	1186	—	251	614	370	729	92	482	**6239**	15·7
9·0—14·0	16384	7007	16063	4864	7731	10173	5750	137	1223	**69332**	9·7
4·0— 8·5	3075	958	4439	946	1361	2058	1748	65	183	**14833**	5·6
≦ 3·5	729	172	1160	327	440	583	306	6	—	**3723**	3·3[3])
Total ...	22845	9483[1])	21662	6388	10146	13224	8779	300	1928[2])	**94755**	8·3

Table 23 (continued).

Weight-Classes	Torulo Region	Kemi Region	Simo Region: Maksniemi	Simo Region: Simoniemi	Simo Region: Simonkylä	Kuivaniemi Region	Ii Region	Haukipudas Region	Oulu River	Total	Mean Weight, kg.
1942											
>19·0	204	21	—	—	—	20	23	—	81	**349**	20·5
14·5—19·0	3247	464	—	132	17	384	643	106	788	**5781**	16·0
9·0—14·0	11162	2202	18348	4120	4245	4788	5348	130	1117	**51460**	9·7
4·0— 8·5	8655	5062	4211	4979	6548	15160	9181	166	775	**54737**	6·9
≦ 3·5	1462	93	428	410	588	993	667	23	111	**4775**	2·8[3])
Total ...	24730	7842	22987	9641	11398	21345	15862[1])	425	2872	**117102**	7·6
1943											
>19·0	208	—	—	—	70	20	40	—	—	**338**	21·1
14·5—19·0	1494	50	227	—	130	360	152	78	32	**2523**	15·6
9·0—14·0	8041	1576	9288	3231	3670	3571	3366	150	691	**33584**	9·8
4·0— 8·5	10675	3111	16573	4696	4293	10351	6221	100	518	**56538**	6·9
≦ 3·5	507	52	946	384	514	1120	821	43	159	**4546**	2·6[3])
Total ...	20925	4789	27034	8311	8677	15422	10600	371	1400	**97529**	7·2
1944											
>19·0	43	38	—	—	22	20	126	19	—	**268**	20·6
14·5—19·0	1053	181	430	532	325	478	291	76	1303	**4669**	15·7
9·0—14·0	8786	2342	7411	4265	4155	5072	2833	327	6076	**41267**	8·5
4·0— 8·5	7707	1981	6313	3242	3236	8075	4423	189	879	**36045**	6·1
≦ 3·5	4238	640	3270	1326	1368	2669	848	113	24	**14496**	2·3[3])
Total ...	21827	5182	17424[1])	9365	9106	16314	8521	724	8282	**96745**	5·5

[1]) No information since 1940 from Valkeakari and, in the years 1942—1944 from the Ii River weirs (Venäjänkari, Haukka and Illi weirs). The yield from Ajoksenkrunni in 1944 is included in the Maksniemi yield, no information from the years 1941 and 1943.

[2]) Only such salmon of which the scales have been examined have been taken into consideration in the statistics concerning the yield of the Oulu River since 1940. — The total yield was 3034 kg. in 1941, 3554 in 1942 (793 kg. weighing less than 5 kg. a piece), 5263 kg. in 1943 (910 kg. weighing less than 5 kg. a piece), and 15·539 kg. in 1944 (1175 kg. weighing less than 5 kg. a piece).

[3]) The high average of the years 1941—1944 was due to the salmon of the group A.2+ which fell into a lower weight-class because of their restricted growth.

of A.2+ and A.3, as well as A.1+ and A.4 has taken place. The mean weight of the group A.2+ (and of the G-salmon of the same weight) according to the sample from the Tornio River (Kiviranta) in 1940 was 5·1 kg.; in 1941 4·4 kg.; in 1942 3·5 kg.; in 1943 3·6 kg.; and in 1944 3·3 kg. The mean weight of the salmon of life-cycle group A.3 (and of G-salmon of the same weight) was 11·7 kg. in 1940; 11·2 kg. in 1941; 8·3 kg. in 1942; 7·0 kg. in 1943; and 6·9 kg. in 1944. The mean weight of the salmon of the life-cycle group A.4 (and of the G-salmon of the same weight) was 16·8 kg. in 1940; 16·5 kg. in 1941; 14·9 kg. in 1942; 11·8 kg. in 1943; and 10·5 kg. in 1944.

In order to show the changes in the weight-class statistics after the slowing down of the growth-rate I have compiled Table 24, for the material collected from the Tornio River (the Kiviranta weir). The table shows that in 1940 and 1941 the life-cycle classes and weight-classes and the mean weight of the salmon in the respective groups still corresponded rather well but that in 1942, 1943 and 1944 this correlation disappeared. In order to make this change more clear I have drawn up a kind of amending table — Table 25 — giving the correction to be applied to the number of salmon in each weight-class in Table 24, in order to get a result corresponding to that obtained in the life-cycle classification of the material collected from the Tornio River. This table shows that the necessary transfers from one weight-class to another are very small in 1940 and 1941 with the exception of those into the lowest weight-class, the highest limit of which (≦ 3·5) was too high from the beginning. The transfers for 1942—1944 are so great that the statistics given for these years in Tab. 22 and 23 — in so far as weight-classes are considered — cannot be used. The totals, however, can be used, viz., the number of salmon and their total weight.

Table 24.

The Yield obtained during the Period 1940—1944 from the Tornio River (Kiviranta Weir) divided into Weight-Classes and Life-Cycle Groups.

a. Salmon divided into Weight-Classes.

Weight-Classes	Number	%	kg.	kg./Ind.
1940				
>19·0	5	0·2	99	**19·8**
14·5—19·0	129	5·2	2102	**16·3**
9·0—14·0	495	19·8	5713	**11·5**
4·0— 8·5	1391	55·7	7331	**5·3**
≦ 3·5	477	19·1	912	**1·9**
Total ...	2497	100·0	16157	**6·5**
1941				
>19·0	2	0·2	41	**20·5**
14·5—19·0	64	7·1	1039	**16·2**
9·0—14·0	404	45·0	4558	**11·3**
4·0— 8·5	220	24·5	1212	**5·5**
≦ 3·5	209	23·2	414	**2·0**
Total ...	899	100·0	7264	**8·1**
1942				
>19·0	4	0·2	80	**20·0**
14·5—19·0	88	3·9	1451	**16·5**
9·0—14·0	631	28·1	6434	**10·2**
4·0— 8·5	1087	48·3	6903	**6·4**
≦ 3·5	438	19·5	1161	**2·7**
Total ...	2248	100·0	16030	**7·1**
1943				
>19·0	—	—	—	—
14·5—19·0	23	1·3	360	**15·6**
9·0—14·0	383	21·1	4013	**10·5**
4·0— 8·5	1199	66·2	7708	**6·4**
< 3·5	207	11·4	378	**1·8**
Total ...	1812	100·0	12459	**6·9**
1944				
>19·0	—	—	—	—
14·5—19·0	46	1·3	717	15·6
9·0—14·0	644	18·5	6840	10·6
4.0— 8·5	1098	31·5	6243	5·7
≦ 3·5	1698	48·7	4193	2·5
Total ...	3486	100·0	17993	**5·2**

b. Salmon divided into Life-Cycle Groups.

Life-Cycle Groups	Number	%	kg.	kg./Ind.
1940				
A.4 (partly)	5	0·2	99	**19·8**
A.4, A.5,G	85 (72+13)[1]	3·4	1425	**16·8**
A.3, G	550 (501+49)	22·0	6462	**11·7**
A.2+, G	1529 (1486+43)	61·2	7771	**5·1**
A.1+	328	13·2	400	**1·2**
Total ...	2497	100·0	16157	**6·5**
1941				
A.4	2	0·2	41	**20·5**
A.4, A.5, G	42 (27+15)	4·7	695	**16·5**
A.3, G	470 (451+19)	52·3	5241	**11·2**
A.2+, G	259 (239+20)	28·8	1141	**4·4**
A.1+	126	14·0	146	**1·2**
Total ...	899	100·0	7264	**8·1**
1942				
A.4	4	0·2	80	**20·0**
A.4, G	134 (105+29)	5·9	1990	**14·9**
A.3, G	1393 (1384+9)	62·0	11505	**8·3**
A.2+, G	694 (690+4)	30·9	2424	**3·5**
A.1+	23	1·0	31	**1·3**
Total ...	2248	100·0	16030	**7·1**
1943				
—	—	—	—	—
A.4, A.5, G	194 (192+2)	10·7	2293	**11·8**
A.3, G	1355 (1331+24)	74·8	9527	**7·0**
A.2+, G	141 (123+18)	7·8	502	**3·6**
A.1+	122	6·7	137	**1·1**
Total ...	1812	100·0	12459	**6·9**
1944				
—	—	—	—	—
A.4	766	22·0	8076	10·5
A.3, G	493 (477+16)	14·1	3400	6·9
A.2+, G	1819 (1810+9)	52·2	5980	3·3
A.1, G	408 (397+11)	11·7	537	1·3
Total ...	3486	100·0	17993	**5·2**

[1]) The first one of the figures in brackets indicates the number of salmon which have ascended for the first time and the second that of the G-individuals.

Table 25.

The Salmon-Catches at Kiviranta Weir (Tornio River) in the Years 1940—1944. The Correlation between the Numbers in the Weight-Classes and the Numbers in the Life-Cycle Groups.

Weight-Classes	Life-Cycle Groups: Number according to Weights and Corrections		Number according to Scale-Analysis
1940			
<19·0	5±0	=	5
14·5—19·0	129—44	=	85
9·0—14·0	495+44+11	=	550
4·0— 8·5	1391—11+149	=	1529
≥ 3·5	477—149	=	328
Total ...	2497		2497
1941			
<19·0	2±0	=	2
14·5—19·0	64—22	=	42
9·0—14·0	404+22+44	=	470
4·0— 8·5	220—44+83	=	259
> 3·5	209—83	=	126
Total ...	899		899
1942			
<19·0	4±0	=	4
14·5—19·0	88+46	=	134
9·0—14·0	631—46+808	=	1393
4·0— 8·5	1087—808+415	=	694
≥ 3·5	438—415	=	23
Total ...	2248		2248
1943			
<19·0	—		—
14·5—19·0	23+171	=	194
9·0—14·0	383—171+1143	=	1355
4·0— 8·5	1199—1143+85	=	141
≥ 3·5	207—85	=	122
Total ...	1812		1812
1944			
<19·0	—		—
14·5—19·0	46+720	=	766
9·0—14·0	644—720+569	=	493
4·0— 8·5	1098—569+1301	=	1830
> 3·5	1698—1301	=	397
Total ...	3486		3486

The statistical information obtained in Sweden regarding the salmon yield is exceptionally good because the number as well as the total weight of the salmon caught in the great salmon rivers is reported. The mean weight can therefore be calculated for each year. And, since there is a reason to suppose that the same mean weight is applicable also to the salmon caught in the sea, the total number of the latter can be estimated. Thus the statistics regarding the salmon yield in Sweden are very representative, and of great value for comparison with the Finnish figures, particularly for the Gulf of Bothnia. The statistics of the salmon yield of Sweden from the year 1936 onwards are given in Tables 26—27, which are directly connected with Tables 6—8 of my earlier report (l. c., pp. 17—19).

The salmon yield for the period in question in Denmark (the Bornholm area), in Germany (the Baltic Sea area), in Poland, and in Latvia, in so far as information is available, are presented in Table 27, which thus deals with the salmon yield in the Baltic Sea (not including the Gulf of Finland and the Gulf of Bothnia). Table 27 also includes (in a note) the information given by Dr. Edward Reinwald regarding Esthonia in the years 1936—1939 and some information from the Soviet Union on catches made in the Gulf of Finland.

The figures given in Table 28 merit attention. They show that the salmon years 1936, 1941—1944 which were good in Finland were also good on the Swedish side of the Bothnian Bay and the Gulf of Bothnia and that correspondingly the years 1938, 1939 and 1940 were less plentiful. Consequently the classification of the salmon catches in the two countries corresponds to each other. Further the northern region of the Bothnian Bay is an important centre of salmon fishing for Sweden also: the number of salmon caught in the northern region of the Bothnian Bay, i. e., the Tornio—Oulu area and the Norrland region amounts to 62—70% of the total yield of the Gulf of Bothnia.

We can see from Table 27 that salmon fishing during the years 1936 and 1942—1944 was also good in the southern region of the Baltic, particularly in the Gotland area and off the coast of Blekinge. The catch in 1936 in the Bornholm region belonging to Denmark was similarly above the average.

Table 26 A. **Swedish Catches of Salmon in G**

(l. c., T

Year	Norrbotten			Västerbotten			Västernorrland		
	Sea	River	Total	Sea	River	Total	Sea	River	T
1936	91·7	66·5	158·2	21·1	6·7	27·9	12·7	46·0	5
1937	72·1	—	—	19·9	—	—	14·2	35·2	4
1938	67·5	30·4	97·9	17·8	5·0	22·8	17·2	37·0	5
1939	85·5	32·8	118·3	20·0	5·3	25·3	20·3	34·2	5
1940	74·8	29·1	104·0	20·5	1·3	21·8	17·8	36·3	5
1941	139·0	49·9	188·9	25·5	13·2	38·8	21·8	55·8	7
1942	123·4	76·9	200·3	25·8	9·4	35·1	36·9	39·9	7
1943	292·0	(35·6)[1]	327·6	36·0	16·6	52·6	38·3	58·4	9
1944	211·7	(63·6)	275·3	35·5	15·0	50·5	44·6	50·8	9
Mean ...	128·6	48·1	184·2	24·7	10·3	34·4	24·9	43·7	6

[1]) Only Tornio River.

Table 26 B. Catch of Salmon from certain Swedish Rivers in Number and Average Weights in kg.

(l. c., Table 7, pp. 18—19).

Year	Torne[1])	Lule	Skellefte	Ume	Ånger-mann	Indal	Ljungan	Ljusne	Dal	Mörrum
					Number					
1936	3217	1921	575	70	1926	1837	464	763	357	569
1937	—	—	—	—	1328	1238	338	850	89	1062
1938	1907	2373	272	250	1283	2105	355	859	67	1414
1939	3218	3289	357	414	1195	2268	314	1128	137	545
1940	3300	1358	130	—	975	2637	294	491	191	1092
1941	2196	3080	442	1114	1842	3199	287	890	270	5414
1942	3526	6173	698	442	1555	2372	288	2585	392	1186
1943	(4937)	—	1255	1193	2910	3450	596	1864	469	1289
1944	—	7500	1232	1174	3406	2842	676	—	445	1479
					Average Weight in Kilogrammes					
1936	8·9	11·7	10·0	8·8	10·4	9·2	10·0	9·8	6·8	9·2
1937	—	—	—	—	12·1	9·9	10·3	10·6	7·3	8·8
1938	(3·2)	8·4	10·9	8·2	9·7	8·9	9·4	9·8	7·3	9·6
1939	(3·4)	6·6	10·2	(4·0)	9·3	8·1	9·1	9·7	6·3	9·2
1940	5·7	7·6	9·7	—	8·9	8·4	9·0	9·7	4·1	6·0
1941	6·8	11·4	10·7	7·6	10·1	9·6	9·3	9·5	4·2	(2·3)
1942	7·0	8·5	9·3	6·5	9·2	8·4	8·6	8·5	6·3	8·3
1943	(7·2)	—	7·8	5·7	8·2	7·4	9·8	8·2	6·6	7·9
1944	—	8·0	7·7	5·7	7·3	7·0	8·5	—	8·0	8·5

[1]) Incl. Sea Trout.

Areas in 1936—1944 (in '000 kg.)
9).

Gävleborg		Uppsala-Stockholm			Bothnia Areas			Percentages				
River	Total	Sea	River	Total	Sea	River	Total	Norr-botten	Väster-botten	Väster-norrland	Gävle-borg	Uppsala-Stockholm
8·0	19·4	2·9	2·4	5·4	**139·9**	**129·7**	**269·6**	58·7	10·3	21·8	7·2	2·0
10·6	18·5	2·0	0·6	2·7	**116·0**	—	—	—	—	—	—	—
8·8	18·0	2·1	0·4	2·6	**113·8**	**81·7**	**195·5**	50·1	11·7	27·7	9·2	1·3
11·0	23·1	1·9	0·9	2·8	**139·9**	**84·2**	**224·0**	52·8	11·3	24·4	10·3	1·2
4·8	11·0	1·8	0·8	2·6	**121·2**	**72·2**	**193·4**	53·8	11·3	28·0	5·7	1·2
8·5	15·7	2·9	1·1	4·1	**196·4**	**128·6**	**325·0**	58·1	11·9	23·9	4·8	1·3
21·9	29·2	3·9	2·5	6·4	**197·2**	**150·5**	**347·7**	57·6	10·1	22·1	8·4	1·8
15·4	33·3	3·0	3·0	6·0	**387·2**	**(129·7)**	**516·2**	63·5	10·2	18·7	6·4	1·2
13·1	30·8	2·4	3·7	6·1	**311·9**	**146·2**	**458·1**	60·2	11·0	20·8	6·7	1·3
11·3	22·1	2·5	1·7	4·3	**191·5**	**115·4**	**316·2**	58·7	11·0	21·9	7·0	1·4

Table 27. Catches of Salmon from the Baltic proper in 1936—1944 (in '000 kg.)
(l. c., Table 8, p. 17).

Year	Sweden						Total	Denmark	Germany	Poland	Latvia
	Gothland Sea	Kalmar Sea	Blekinge Sea	Blekinge Mörrum	Kristianstad Sea	Malmö Sea		Bornholm Sea	Sea[1])	Sea	Sea
1936	43·5	22·7	80·6	5·2	8·1	2·5	**162·6**	56·8	102·9	63·7	47·7
1937	30·7	14·3	57·4	9·4	11·0	4·9	**127·7**	28·0	56·3	28·3	84·0
1938	18·5	20·3	18·0	13·5	6·4	2·8	**79·5**	28·6	—	26·9	71·5
1939	33·3	13·8	13·2	5·0	6·8	1·8	**73·9**	35·0	—	—	—
1940	13·7	7·3	21·6	6·6	7·6	4·4	**61·2**	47·1	—	—	—
1941	31·8	20·1	13·3	12·7	3·6	2·0	**83·5**	77·0	—	—	—
1942	46·7	8·1	84·4	9·9	5·8	2·2	**157·3**	126·0	—	—	—
1943	104·6	30·6	66·6	10·2	2·5	0·7	**215·2**	153·0	—	—	—
1944	86·7	34·7	251·1	12·8	14·5	0·3	**400·1**	142·0	—	—	—

[1]) Incl. Sea Trout.

Esthonian catches have been ('000 kg.) 67·6 in 1936, 69·0 in 1937, 65·7 in 1938, and 55·0 in 1939 (according to Edw. Reinwaldt). The Soviet-Russian catches from the eastern part of the Finnish Gulf and its river system (Neva and Luga Rivers) have been ('000 kg.): 24·0 in 1936, 24·6 in 1937, and 35·9 in 1938 (according L. S. Berg in Bull. Inst. Fresh-Water Fisheries. Vol. XXIII, 1940, p. 15.

The Polish salmon statistics give the number as well as the weight of the large salmon and of the mielnica separately. – The catch was 6.478 large salmon and 12.234 mielnica (= 5·760 kg.) in 1936, 2.858 large salmon and 5.064 (2·420 kg. mielnica in 1937; the catch of mielnica was about 1·100 kg. in 1939. Cf. Rapp. et Proc.-Verb., Vol. Nos. 105, 107 and 109 (Salmon and Trout Committee), also l. c., Tab. 9, p. 17.

Table 28. The Salmon Yield from the Bothnian Bay and Gulf of Finland during the Period 1936—1942.

	1936	1937	1938	1939	1940	1941	1942	1943	1944
1. Bothnian Bay:									
(*a*) Tornio—Oulu (1—8):	169·0	130·6	98·5	105·4	131·3	145·7	184·9	230·1	225·5
Norrbotten:	158·2	—	97·9	118·3	104·0	188·9	200·3	327·6	275·3
Total: ...	**327·2**	—	**196·4**	**223·7**	**235·3**	**334·6**	**385·2**	**557·7**	**500·8**
%: ...	70·1	—	61·7	62·3	67·5	68·6	68·9	71·9	69·7
(*b*) Coast of Finland (9—10):...	11·2	8·9	10·9	7·1	6·5	7·1	9·5	12·0	12·4
Vesterbotten:	27·9	—	22·8	25·3	21·8	38·8	35·1	52·6	50·5
Total: ...	**39·1**	—	**33·7**	**32·4**	**28·3**	**45·9**	**44·6**	**64·6**	**62·9**
%: ...	8·4	—	10·6	9·0	8·1	9·4	8·0	8·3	8·7
2. Bothnian Sea:									
Coast of Finland (11—13): ..	22·0	20·2	16·0	25·3	20·2	13·7	23·2	23·2	29·0
Vesternorrland-Gävleborg: ..	78·1	67·8	72·1	77·7	65·1	93·3	105·9	130·0	126·2
Total: ...	**100·1**	**88·0**	**88·1**	**103·0**	**85·3**	**107·0**	**129·1**	**153·2**	**155·2**
%: ...	21·5	—	27·7	28·7	24·4	22·0	23·1	19·8	21·6
3. Bothnian Bay + Bothnian Sea:	**466·4**	—	**318·2**	**359·1**	**348·9**	**487·5**	**558·9**	**775·5**	**718·9**

II. Size and Ratio between the Sexes.

1. Length and Weight Measurements.

Detailed information of the length and weight of the salmon which have been investigated as to age and life-cycle class is given on pp. 72—106. Tables 29, 30 and 31 are summaries.

The summaries show that the size of the salmon in the same life-cycle class has not remained constant during the period in question. Particularly in more recent years, i. e. 1942—1944, the mean size of the salmon in all the life-cycle classes has diminished. This can be seen from the following figures.

	Mean Length cm.		
	1921—1935	1936—1941	1942—1944
A.1+	53·4	53·6	49·4
A.2+	79·6	78·8	69·3
A.3.....	97·4	100·3	87·5
A.4.....	112·6	114·0	102·9
A.5.....	123·6	121·7	121·5

	Mean Weight kg.		
	1921—1935	1936—1941	1942—1944
A.1+	1·64	1·64	1·25
A.2+	5·83	5·63	3·4
A.3.....	11·3	11·72	7·5
A.4.....	16·1	16·73	11·6
A.5.....	20·3	20·21	17·0

It is not easy to find the cause, or causes of this phenomenon. It can, however, be compared with that observed as the result of the fluctuations in the stock of different species of white fish (Coregonus)[1]). In the stocks of these species the capacity of growth and the size reached at different ages are greatly dependent upon the number of individuals in the stock; that is, when the stock is abundant the size is smaller and again when the stock is poor the growth-rate increases. Evidently this is a natural result of the fact that the available nourishment is divided among larger or smaller numbers. Consequently the decrease in the size of the salmon in the years 1942—1944 would be a sign of a great increase in the density of the stock, which might be caused on the one hand by years favourable for reproduction and on the other hand by the decrease in fishing intensity because of the war, particularly in the southern region of the Baltic Sea. But this phenomenon might be due also to the exceptionally severe winters 1939/1940 and 1941/1942, especially the latter, which could have affected the feeding of the salmon then in the Baltic.

[1]) Järvi, T. H. 1940. Über den Maränenbestand im Pyhäjärvi (Süd-Finnland). Acta Zoologica Fennica 28. Järvi, T. H. 1942. Die Bestände der kleinen Maränen (*Coregonus albula* L) und ihre Schwankungen. 1. Pyhäjärvi, 2. Ober- und Mittel-Keitele. Acta Zoologica Fennica 32 u. 33.

(Cont. page 68)

Table 29. **Mean Length of Salmon: Number of Fish in Brackets**

(l. c., Table 27, pp. 74—76).

Age before ascending	Years	Life-Cycle Classes ...	Tornio Region		Kemi Region		Oulu River		
3—5			3.1+	4.1+	3.1+		3.1+		
	1936		51·5 (163)	53·1 (54)	51·7 (59)		56·0 (63)		
	1937		55·0 (55)	55·0 (9)	56·0 (57)		60·5 (15)		
	1938		54·3 (339)	57·0 (51)	57·3 (169)		59·4 (138)		
	1939		54·0 (1342)	52·9 (189)	54·2 (498)		56·1 (124)		
	1940		47·8 (298)	47·6 (16)	50·3 (67)		49·9 (11)		
	1941		46·2 (109)	48·3 (11)					
	1942		49·1 (18)	59·5 (4)	—	—	—	—	A.1+
	1943		46·4 (106)	48·7 (14)	—	—	—	—	Total Mean
	1944		50·2 (359)	47·7 (21)	53·0 (7)		—	—	Result:
Total Mean:	1936—41		**52·7** (2306)	**53·2** (330)	**54·5** (850)		**57·4** (351)		**53·6** (3837)
	1942—44		**49·3** (483)	**49·3** (39)	**53·0** (7)		—	—	**49·4** (529)
4—6			3.2+	4.2+	3.2+		3.2+		
	1936		78·8 (699)	78·9 (115)	79·5 (319)		86·4 (95)		
	1937		77·1 (33)	77·2 (19)	89·6 (53)		84·6 (28)		
	1938		82·0 (61)	81·8 (4)	80·8 (200)		80·2 (76)		
	1939		81·1 (216)	81·6 (16)	81·3 (536)		86·9 (84)		
	1940		76·6 (1194)	76 8 (212)	78·3 (482)		78·1 (38)		
	1941		72·2 (201)	74·3 (22)	71·8 (13)		78·3 (6)		
	1942		70·3 (595)	69·9 (51)	71·1 (15)		76·5 (92)		A.2+
	1943		67·2 (109)	66·5 (8)	68·5 (29)		71·2 (34)		Total Mean
	1944		68·5 (1707)	72·0 (43)	67·6 (59)		72·7 (30)		Result:
Total Mean:	1936—41		**77·4** (2404)	**77·5** (388)	**80·2** (1603)		**83·8** (327)		**78·8** (4722)
	1942—44		**68·9** (2411)	**70·5** (102)	**68·4** (103)		**74·6** (156)		**69·3** (2772)
5—7			3.3	4.3	3.3		3.3		
	1936		99·3 (704)	99·7 (154)	98·4 (632)		103·9 (754)		
	1937		99·4 (91)	97·4 (36)	98·0 (386)		103·6 (216)		
	1938		99·2 (30)	100·1 (9)	98·0 (213)		103·2 (155)		
	1939		101·3 (89)	108·0 (1)	99·6 (257)		106·9 (136)		
	1940		100·1 (410)	99·7 (70)	99·4 (294)		104·0 (166)		
	1041		98·2 (383)	98·4 (27)	96·7 (235)		102·2 (79)		
	1042		90·7 (1150)	90·5 (84)	89·4 (204)		97·5 (73)		A.3
	1943		84·7 (1205)	83·5 (53)	86·7 (433)		88·9 (97)		Total Mean
	1944		84·5 (452)	86·4 (8)	84·2 (57)		94·4 (80)		Result:
Total Mean:	1936—41		**99·4** (1707)	**99·3** (297)	**98·4** (2017)		**104·0** (1506)		**100·3** (5527)
	1942—44		**87·1** (2807)	**87·7** (145)	**87·3** (694)		**93·2** (250)		**87·5** (3896)
6—8			3.4	4.4	3.4		3.4		
	1936		112·7 (120)	112·9 (39)	112·6 (93)		114·9 (172)		
	1937		111·3 (29)	112·6 (12)	111·5 (29)		115·2 (78)		
	1938		113·6 (9)	115·0 (2)	113·2 (74)		115·4 (62)		
	1939		111·6 (17)	118·0 (1)	112·1 (19)		118·0 (6)		
	1940		115·0 (69)	117·0 (5)	114·3 (35)		116·6 (18)		
	1941		115·3 (22)	115·3 (4)	112·3 (28)		121·0 (17)		
	1942		113·3 (87)	119·3 (3)	112·8 (13)		112·3 (60)		A.4
	1943		102·5 (145)	104·7 (6)	102·7 (205)		105·3 (16)		Total Mean
	1944		99·4 (656)	99·0 (8)	99·8 (117)		104·8 (542)		Result:
Total Mean:	1936—41		**113·3** (266)	**113·5** (63)	**112·8** (278)		**115·5** (353)		**114·0** (960)
	1942—44		**101·3** (888)	**104·6** (17)	**102·1** (335)		**105·5** (618)		**102·9** (1858)

Table 29 (continued).

Age before ascending		Life-Cycle Classes ...	Tornio Region 3.5		Tornio Region 4.5		Kemi Region 3.5		Oulu River 3.5		
7—9	Years										
	1936		114·2	(18)	—	—	122·0	(2)	125·2	(16)	
	1937		121·5	(2)	—	—	118·8	(4)	123·5	(15)	
	1938		—	—	—	—	122·9	(7)	123·7	(10)	
	1939		—	—	125·0	(1)	120·0	(1)	123·2	(5)	
	1940		123·5	(2)	—	—	121·0	(2)	—	—	
	1941		124·3	(3)	—	—	120·0	(2)	128·3	(3)	
	1942		—	—	—	—	—	—	127·3	(3)	A.5
	1943		120·0	(1)	—	—	—	—	115·0	(1)	Total Mean
	1944		—	—	—	—	—	—	116·5	(2)	Result:
Total Mean:	1936—41		**116·7**	(25)	125·0	(1)	**121·2**	(18)	**124·4**	(49)	**121·7** (93)
	1942—44		120·0	(1)	—	—	—	—	**121·7**	(6)	**121·5** (7)

Table 30. **Mean Weight of Salmon.** Number of Fish in Brackets (l. c., Table 27, pp. 74—76).

Age before ascending		Life-Cycle Classes ...	Tornio Region 3.1+		Tornio Region 4.1+		Kemi Region 3.1+		Oulu River 3.1+		
3—5	Years										
	1936		1·33	(163)	1·53	(54)	1·45	(59)	1·70	(63)	
	1937		1·79	(55)	1·82	(9)	2·02	(57)	2·32	(15)	
	1938		1·71	(339)	1·97	(51)	1·98	(169)	2·55	(138)	
	1939		1·61	(1342)	1·47	(189)	1·73	(498)	2·07	(124)	
	1940		1·21	(298)	1·23	(16)	1·51	(67)	1·67	(11)	
	1941		1·13	(109)	1·19	(11)	—	—	—	—	
	1942		1·24	(18)	2·10	(4)	—	—	—	—	A.1+
	1943		1·12	(106)	1·19	(14)	—	—	—	—	Total Mean
	1944		1·29	(359)	1·10	(21)	1·67	(7)	—	—	Result:
Total Mean:	1936—41		**1·53**	(2306)	**1·55**	(330)	**1·76**	(850)	**2·19**	(351)	**1·64** (3837)
	1942—44		**1·25**	(483)	**1·23**	(39)	**1·67**	(7)	—	—	**1·25** (525)
4—6			3.2+		4.2+		3.2+		3.2+		
	1936		5·63	(699)	5·61	(115)	5·84	(319)	7·09	(95)	
	1937		5·45	(33)	5·42	(19)	5·41	(53)	6·95	(28)	
	1938		6·54	(61)	6·80	(4)	6·05	(200)	7·06	(76)	
	1939		6·22	(216)	6·07	(16)	6·37	(536)	7·77	(84)	
	1940		5·11	(1194)	5·07	(212)	5·46	(482)	5·51	(38)	
	1941		4·23	(201)	4·43	(22)	4·65	(13)	5·33	(6)	
	1942		3·56	(595)	3·48	(51)	3·85	(15)	4·46	(92)	A.2+
	1943		3·24	(109)	3·31	(8)	4·33	(3)	3·79	(34)	Total Mean
	1944		3·26	(1707)	3·88	(43)	3·25	(26)	4·55	(30)	Result:
Total Mean:	1936—41		**5·33**	(2404)	**5·20**	(388)	**5·91**	(1603)	**7·03**	(327)	**5·63** (4722)
	1942—44		**3·33**	(2411)	**3·64**	(102)	**3·53**	(44)	**4·33**	(156)	**3·40** (2713)
5—7			3.3		4.3		3.3		3.3		
	1936		11·72	(704)	11·83	(154)	11·30	(632)	12·54	(754)	
	1937		11·81	(91)	11·67	(36)	11·44	(386)	12·22	(216)	
	1938		11·65	(30)	11·94	(9)	10·97	(213)	11·97	(155)	
	1939		12·49	(89)	13·00	(1)	11·66	(257)	13·27	(136)	
	1940		11·84	(410)	11·59	(70)	11·46	(294)	12·59	(166)	
	1941		11·21	(383)	11·63	(27)	10·16	(235)	10·80	(79)	

Table 30 (continued).

Age before ascending		Tornio Region				Kemi Region		Oulu River		
5—7	Years Life-Cycle Classes ...	3.3		4.3		3.3		3.3		
	1942	8·26	(1150)	8·16	(84)	7·44	(204)	9·43	(73)	A.3
	1943	6·94	(1205)	6·54	(53)	6·79	(180)	7·86	(97)	Total Mean
	1944	6·75	(452)	7·38	(8)	5·50	(7)	7·97	(80)	Result:
Total Mean:	1936—41	**11·69**	(1707)	**11·74**	(297)	**11·23**	(2017)	**12·41**	(1506)	**11·72** (5527)
	1942—44	**7·45**	(2807)	**7·52**	(145)	**7·11**	(391)	**8·35**	(250)	**7·48** (3593)
6—8		3.4		4.4		3.4		3.4		
	1936	17·11	(120)	17·28	(39)	17·36	(93)	16·53	(172)	
	1937	16·65	(29)	16·49	(12)	17·00	(29)	16·79	(78)	
	1938	16·53	(9)	17·50	(2)	16·05	(74)	16·52	(62)	
	1939	16·20	(17)	17·50	(1)	16·33	(19)	16·50	(6)	
	1940	17·00	(69)	16·60	(5)	16·11	(35)	16·96	(18)	
	1941	17·16	(22)	16·75	(4)	15·38	(28)	17·00	(17)	
	1942	16·05	(87)	19·17	(3)	14·96	(13)	14·27	(60)	A.4
	1943	11·67	(145)	12·67	(6)	11·20	(36)	12·09	(16)	Total Mean
	1944	10·46	(656)	10·94	(8)	9·29	(15)	11·91	(542)	Result:
Total Mean:	1936—41	**16·96**	(266)	**17·05**	(63)	**16·55**	(278)	**16·63**	(353)	**16·73** (960)
	1942—44	**11·21**	(888)	**13·00**	(17)	**11·52**	(64)	**12·14**	(618)	**11·60** (1587)
7—9		3.5		4.5		3.5		3.5		
	1936	20·75	(18)	—	—	21·75	(2)	20·62	(16)	
	1937	21·50	(2)	—	—	19·73	(4)	20·45	(15)	
	1938	—	—	—	—	20·50	(7)	19·60	(10)	
	1939	—	—	20·0	(1)	18·00	(1)	20·50	(5)	
	1940	18·00	(2)	—	—	18·50	(2)	—	—	
	1941	18·33	(3)	—	—	19·50	(2)	18·83	(3)	
	1942	—	—	—	—	—	—	20·00	(3)	A.5
	1943	18·00	(1)	—	—	—	—	11·50	(1)	Total Mean
	1944	—	—	—	—	—	—	14·75	(2)	Result:
Total Mean:	1936—41	**20·30**	(25)	20·00	(1)	**20·00**	(18)	**20·24**	(49)	**20·21** (93)
	1942—44	18·00	(1)	—	—	—	—	**16·83**	(6)	**17·00** (7)

Table 31. Weight of Salmon the Age and Life-Cycle of which has been determined.

(Number of Specimens see Table 9, p. 32.)

Year	Life-Cycle Group	Tornio River kg.	Kemi Valkeakari kg.	Kemi River kg.	Oulu River kg.	Total kg.	Mean Weight kg.
1936	A.1+	314	122	—	122	558	**1·5**
	A.2+	4618	1648	687	978	7931	**5·8**
	A.3	10224	6654	2075	11779	30732	**11·9**
	A.4	2846	1306	744	3635	8531	**17·0**
	A.5	394	18	49	372	833	**20·8**
	G	2025	1163	692	1035	4915	**12·6**
	Total	20421	10911	4247	17921	53500	
	Mean	**9·0**	**9·9**	**10·2**	**12·3**	**10·2**	

Year	Life-Cycle Group	Tornio River kg.	Kemi Valkeakari kg.	Kemi River kg.	Oulu River kg.	Total kg.	Mean Weight kg.
1937	A.1+	121	193	—	46	360	**2·0**
	A.2+	294	409	21	241	965	**5·2**
	A.3	1546	4422	629	3794	10391	**11·3**
	A.4	716	580	100	1572	2968	**16·7**
	A.5	43	79	59	460	641	**20·7**
	G	540	1394	155	485	2574	**12·9**
	Total	3260	7077	964	6598	17899	
	Mean	**9·6**	**10·2**	**6·7**	**12·8**	**10·6**	

Table 31 (continued).

Year	Life-Cycle Group	Tornio River kg.	Kemi Valkeakari kg.	Kemi River kg.	Oulu River kg.	Total kg.	Mean Weight kg.
1938	A.1+	697	329	39	465	1530	**2·0**
	A.2+	429	1020	691	749	2889	**6·4**
	A.3	537	1803	1366	2223	5929	**11·4**
	A.4	204	508	806	1138	2656	**16·3**
	A.5	—	164	—	237	401	**20·1**
	G	230	610	393	591	1824	**12·2**
	Total	2097	4434	3295	5403	15229	
	Mean	**3·9**	**7·8**	**9·2**	**9·0**	**7·3**	
1939	A.1+	2607	933	205	283	4028	**1·7**
	A.2+	1454	2752	948	844	5998	**6·5**
	A.3	1152	2319	1644	2329	7444	**12·3**
	A.4	325	253	140	137	855	**16·4**
	A.5	20	—	18	102	140	**20·0**
	G	431	520	295	214	1460	**12·3**
	Total	5989	6777	3250	3909	19925	
	Mean	**3·0**	**5·6**	**7·0**	**8·6**	**4·8**	
1940	A.1+	400	120	—	23	543	**1·3**
	A.2+	7554	2109	1183	253	11099	**5·2**
	A.3	5918	2214	1563	2709	12404	**11·9**
	A.4	1276	444	206	336	2262	**16·8**
	A.5	36	23	14	23	96	**19·2**
	G	1013	365	236	188	1802	**9·8**
	Total	16197	5275	3202	3532	28206	
	Mean	**6·5**	**7·4**	**7·9**	**11·4**	**7·2**	
1941	A.1+	143	—	—	—	143	**1·1**
	A.2+	1013	—	111	54	1178	**4·3**
	A.3	5045	—	2608	1081	8734	**10·8**
	A.4	444	—	498	392	1334	**16·3**
	A.5	55	—	39	56	150	**18·8**
	G	575	—	347	344	1266	**10·6**
	Total	7275	—	3603	1927	12805	
	Mean	**8·1**	—	**10·2**	**11·6**	**9·0**	
1942	A.1+	31	—	—	—	31	**1·3**
	A.2+	2443	134	79	539	3195	**3·7**
	A.3	11512	357	1772	985	14626	**8·3**
	A.4	1748	66	316	951	3081	**15·3**
	A.5	—	—	—	60	60	**20·0**
	G	379	—	161	310	850	**10·6**
	Total	16113	557	2328	2845	21843	
	Mean	**7·1**	**6·5**	**8·0**	**8·9**	**7·4**	
1943	A.1+	138	—	—	—	138	**1·1**
	A.2+	402	8	13	169	592	**2·7**
	A.3	9239	681	1287	819	12026	**5·5**
	A.4	2242	273	459	321	3295	**8·5**
	A.5	18	—	—	29	47	**15·7**
	G	422	—	75	62	559	**7·1**
	Total	12461	962	1834	1400	16657	
	Mean	**6·9**	**7·9**	**7·5**	**7·7**	**5·5**	
1944	A.1+	512	—	15	—	527	**1·3**
	A.2+	5922	29	250	193	6394	**3·3**
	A.3	3223	92	351	738	4404	**6·8**
	A.4	8076	400	1265	7125	16866	**10·9**
	A.5	—	—	—	48	48	**16·0**
	G	260	—	70	179	509	**8·3**
	Total	17993	521	1951	8283	28748	
	Mean	**5·2**	**7·6**	**6·6**	**11·1**	**6·2**	
1936—44	A.1+ .	4963	1697	259	939	7858	**1·6**
	A.2+ .	24129	8109	3983	4020	40241	**4·8**
	A.3 ...	48396	18542	13295	26457	106690	**9·6**
	A.4 ...	17877	3830	4534	15607	41848	**12·9**
	A.5 ...	566	284	179	1387	2416	**20·1**
	G	5875	4052	2424	3408	15759	**11·4**
	Total .	101806	36514	24674	51818	214812	
	Mean .	**6·3**	**7·2**	**7·9**	**10·9**	**7·4**	

When the catches are surveyed from an economic point of view weight is of greater significance than the number of fish. It is therefore appropriate to examine the relations between the two values.

As a basis of comparison I shall again take the ratios which prevailed as averages between the most important life-cycle groups of the years 1921—1935 (l. c. p. 67 etc.). The percentages were as follows: group A.3 amounted to 50·8%, A.2+ to 24·9%, A.1+ to 10·2%, A.4 to 8·4%, A.5 to 1·2% and the salmon which had previously spawned amounted 4·5%. In levelling these percentages somewhat in the catches of the years 1921—1935 we find that among 100 individuals there were on the average 51 from group A.3, 25 from A.2+, 10 from A.1+, 8 from A.4, 1 from A.5 and 5 from those previously spawned. When we make the same calculations with respect to the catches from Bothnian Bay during the years 1938, 1939 and 1944 we get the figures for the different life-cycle groups in the table below.

When the mean weight of the salmon belonging to different life-cycle groups is known (A.1+, 1·64 kg.; A.2+, 5·83 kg.; A.3, 11·3 kg.; A.4, 16·1 kg.; A.5, 20·3 kg.)[1]; it is easy to determine the yield in kg. of a hundred individuals divided among the life-cycle groups. In the table below these calculations have been made for the years 1921—1935 and for the years

[1]) The determination of the mean weight of previously spawned salmon is not so accurate, because they belong to such different life-cycle classes. Since most of these salmon belong to the life-cycle group A.3G1, 11·3 kg. has been taken as the mean weight.

Life-Cycle Group	Number of Fish				Total Weight, kg.			
	1921—35	1938	1939	1944	1921—35	1938	1939	1944
A.1+	10	37	59	9	16	61	97	11
A.2+	25	22	22	42	146	128	128	143
A.3	51	25	15	14	576	283	170	105
A.4	8	8	1	34	129	129	16	394
A.5	1	1	—	—	20	20	—	—
G	5	7	3	1	57	80	34	11
Total	100	100	100	100	944	701	445	664
Mean Weight:					9·4	7·0	4·45	6·6

1938, 1939 and 1944 and we see how much smaller was the weight of a hundred salmon in 1938, and especially in 1939 than the average weight of the years 1921—1935. Consequently the salmon yield of the years 1938 and 1939 was economically poor despite the individual abundance. The weight in 1939 was less than one half (47·1%) and that in 1938 74·3% of the average weight in 1921—1935. The great deficit in the year 1944 is due to a decrease in the mean weights of all the life-cycle groups (A.1+, 1·25 kg., A.2+, 3·4 kg., A.3, 7·5 kg., A.4, 11·6 kg.). Thus the disproportion between the individual abundance and the yield in kg. is considerable.

2. Ratio of the Sexes in the Life-Cycle Groups.

The ratio between the sexes is shown in Table 32. As the determination of the sex of the salmon is not based on dissection but only on external signs, i. e., the form of the point of the lower jaw, the life-cycle group A.1+ has been omitted both in Table 32 and partly in the subject material itself. According to the material published in 1936 the majority of the individuals belonging to this life-cycle group were males (l. c. p. 112).

Table 32 shows that among the salmon which are ascending for the first time (omitting group A.1+), the proportion of males was 24·5% (5,238) and of females 75·5% (16,172); of the salmon making their second ascent the males numbered 28·9% (361) and the females 71·1% (887); of the one hundred salmon making their third ascent 27 were males and 73 females; there were only seven salmon which had already made three or four ascents and of these 3 were males and 4 females.

Table 32. Representation of the Sexes in the different Life-Cycle-Groups (1936—1944)[1]
(l. c. p. 112).

A. Salmon which have not spawned previously (excluding Group A.1+).

Districts:	♂♂ 2.2+	♀♀ 2.2+	♂♂ 3.2+	♀♀ 3.2+	♂♂ 4.2+	♀♀ 4.2+	♂♂ 5.2+	♀♀ 5.2+	♂♂ A.2+	♀♀ A.2+	♂♂ Percentage	♀♀ Percentage
Tornio	80	115	1264	2935	82	396	1	3	1427	3449	29·3	70·7
Kemi, Simo	42	172	167	1562	13	178	—	—	222	1912	10·4	89·6
Oulu	53	83	153	329	1	29	—	—	207	441	31·9	68·1
Total...	**175**	**370**	**1584**	**4826**	**96**	**603**	**1**	**3**	**1856**	**5802**	**24·2**	**75·8**
	2.3		3.3		4.3		5.3		A.3		Percentage	
Tornio	81	240	1077	3394	101	341	2	4	1261	3979	24·1	75·9
Kemi, Simo	62	260	475	2458	49	159	4	1	590	2878	17·0	83·0
Oulu	29	334	182	1574	9	81	—	1	220	1990	10·0	90·0
Total...	**172**	**834**	**1734**	**7426**	**159**	**581**	**6**	**6**	**2071**	**8847**	**19·0**	**81·0**
	2.4		3.4		4.4		5.4		A.4		Percentage	
Tornio	71	98	542	562	64	16	2	—	679	676	50·1	49·9
Kemi, Simo	44	41	322	245	28	5	2	—	396	291	57·6	42·4
Oulu	41	94	101	441	5	10	—	—	147	545	21·2	78·8
Total...	**156**	**233**	**965**	**1248**	**97**	**31**	**4**	**—**	**1222**	**1512**	**44·7**	**55·3**
	2.5		3.5		4.5		5.5		A.5		Percentage	
Tornio	1	—	10	—	1	—	—	—	12	—	100·0	0·0
Kemi, Simo	1	—	16	—	3	—	—	—	20	—	100·0	0·0
Oulu	7	3	36+1[2])	11	—	—	—	—	57	11	83·9	16·1
Total...	**9**	**3**	**62+1[2])**	**11**	**4**	**—**	**—**	**—**	**89**	**11**	**89·0**	**11·0**
Ascending for the first time (except Group A.1+)...									**5238**	**16172**	**24·5**	**75·5**

B. Salmon which have spawned once previously.

a. Life-Cycle Classes.

Age	Description	Districts Tornio ♂♂	Tornio ♀♀	Kemi, Simo ♂♂	Kemi, Simo ♀♀	Oulu ♂♂	Oulu ♀♀	Total ♂♂	Total ♀♀	Total and Percentage ♂♂	Total and Percentage ♀♀
4	2.1+G+	—	—	—	1	2	1	2	2	**2**	**2**
5	2.1+G1	2	—	2	2	—	2	4	4	**34**	**12**
	3.1+G+	18	7	6	1	6	—	30	8	73·9%	26·1%
6	2.1+G2	1	—	—	2	1	1	2	3		
	3.1+G1	24	28	16	30	13	13	53	71		
	4.1+G+	—	1	—	—	1	—	1	1	**62**	**101**
	2.2+G1	—	—	—	8	2	3	2	11	38·0%	62·0%
	3.2+G+	2	3	1	8	—	—	3	11		
	2.3G+	1	—	—	4	—	—	1	4		
7	3.1+G2	37	10	15	7	20	9	72	26		
	4.1+G1	4	2	1	2	—	1	5	5		
	3.2+G1	14	73	7	88	5	18	26	179		
	4.2+G+	1	1	—	1	—	—	1	2	**130**	**294**
	2.3G1	2	5	2	7	1	11	5	23	30·7%	69·3%
	3.3G+	13	18	7	33	—	7	20	58		
	2.4G+	—	1	—	—	1	—	1	1		
8	3.1+G3	1	—	1	—	—	—	2	—		
	4.1+G2	6	1	2	3	2	1	10	5		
	3.2+G2	1	—	1	—	1	2	3	2		
	4.2+G1	4	13	—	14	—	—	4	27	**96**	**419**
	3.3G1	29	103	31	191	7	83	67	377	18·6%	81·4%
	4.3G+	—	—	2	—	—	—	2	—		
	2.4G1	—	—	1	1	—	2	1	3		
	3.4G+	3	3	3	—	—	2	6	5		

[1]) The sex has not been determined of a small part of salmon with which my scale samples were concerned.
[2]) This was 3·6, caught in the Oulu River on 12.VII.1937: 130 cm. 26·5 kg., ♂.

Table 32 (continued).

Age	Description	Tornio ♂♂	Tornio ♀♀	Districts Kemi, Simo ♂♂	Districts Kemi, Simo ♀♀	Oulu ♂♂	Oulu ♀♀	Total ♂♂	Total ♀♀	Total and Percentage ♂♂	Total and Percentage ♀♀
9	5.1G2	—	—	1	—	—	—	1	—		
	4.2+G2	—	—	1	—	—	—	1	—	37	59
	4.3G1	7	20	1	13	1	2	9	35	38·5%	61·5%
	3.4G1	8	5	11	5	7	14	26	24		
	Ascending for the second time ...									**361**	**887**
										28·9%	71·1%

b. Combining: Life-Cycle Groups.

	Number ♂♂	Number ♀♀	Percentage ♂♂	Percentage ♀♀
A.1+G+	33	11	75·0	25·0
A.1+G1	63	80	44·1	55·9
A.1+G2	85	34	71·4	28·6
A.1+G3	2	—	—	—
Total ...	**183**	**125**	**59·4**	**40·6**
A.3G+	23	62	27·1	72·9
A.3G1	81	435	15·7	84·3
Total ...	**104**	**497**	**17·3**	**82·7**

	Number ♂♂	Number ♀♀	Percentage ♂♂	Percentage ♀♀
A.2+G+	4	13	—	—
A.2+G1	32	217	12·9	87·1
A.2+G2	4	2	—	—
Total ...	**40**	**232**	**14·7**	**85·3**
A.4G+	7	6	—	—
A.4G1	27	27	50·0	50·0
Total ...	**34**	**33**	**50·7**	**49·3**

C. Salmon which have spawned twice previously.

Age	Description	Number ♂♂	Number ♀♀
7	3.1+G1G1	—	1
	3.2+G+G+	—	1
8	2.2+G1G1	1	—
	3.2+G1G+	2	2
	2.3G1G+	—	1
	3.3G+G+	1	2
9	3.2+G1G1	4	15
	2.3G1G1	1	3
	3.3G1G+	—	2
10	4.1+G2G1	1	—
	4.2+G1G1	1	1
	3.3G1G1	12	40
	2.4G1G1	—	1
11	4.2+G2G1	1	—
	4.3G1G1	2	3
	3.4G1G1	1	1
	Ascending for the third time ...	♂♂: **27**,	♀♀: **73**

D. Salmon which have spawned three times previously (Kemi and Oulu).

Age	Description	Number ♂♂	Number ♀♀
11	4.1+G1G1G1	1	—
	3.2+G1G1G1	—	1
12	3.3G1G1G1	1	3
	Ascending for the fourth time ...	♂♂: **2**,	♀♀: **4**

E. Salmon which have spawned four times previously.

10 5.1+G+G+G+G ... 1 (♂)

III. The Material.

1. The Length, Weight and Number arranged according to the Life-Cycle Classes.

1. Tornio River: Kiviranta.

1936: 2261 Ind. (100 Ind. captured at the Sumisaari weir).

2.1+: 10 Ind. Av. **50·1** cm., **1.36** kg.
cm.: 45, 46 (2), 47, 48, 50, 52, 55 (2), 57.
kg.: 0·7, 1·0 (3), 1·1, 1·4, 1·7 (2), 2·0 (2).

3.1+: 163 Ind. Av. **51·5** cm., **1·33** kg.
cm.: 43, 45 (7), 46 (8), 47 (8), 48 (15), 49 (10), 50 (23), 51 (11), 52 (13), 53 (11), 54 (8), 55 (8), 56 (6), 57 (4), 58 (8), 59 (6), 60 (5), 62.
kg.: 0·6, 0·7 (3), 0·8 (4), 0·9 (8), 1·0 (47), 1·1 (8), 1·2 (15), 1·3 (15), 1·4 (8), 1·5 (16), 1·6 (3), 1·7 (6), 1·8, 1·9 (4), 2·0 (13), 2·1 (4), 2·2 (4), 2·3 (2), 2·4, 2·5.

4.1+: 54 Ind. Av. **53.2** cm., **1·53** kg.
cm.: 43, 45 (2), 46, 48 (2), 49 (2), 50 (9), 51, 52 (5), 53 (6), 54 (4), 55 (8), 56 (2), 57, 58 (2), 59 (4), 60 (3), 61.
kg.: 0·8, 1·0 (10), 1·1 (2), 1·2 (5), 1·3 (3), 1·4 (2), 1·5 (5), 1·6 (4), 1·7 (5), 1·8 (6), 1·9 (3), 2·0 (3), 2·1, 2·2, 2·4, 2·5, 2·7.

2 2+: 4 Ind. (2 ♂, 2 ♀). Av. **79·3** cm., **6·3** kg.
cm.: 74, 79, 80, 84. — kg.: 6·0 (3), 7·0.

3.2+: 699 Ind. (136 ♂, 561 ♀). Av. **78·8** (♂♂: 80·7, ♀♀: 78·4) cm., **5·58** (♂♂: 6·1, ♀♀ 5·5) kg.
cm.: 66 (2), 67 (3), 68 (2), 69 (7), 70 (36), 71 (22), 72 (15), 73 (38), 74 (20), 75 (43), 76 (29), 77 (15), 78 (62), 79 (52), 80 (90), 81 (58), 82 (48), 83 (48), 84 (26), 85 (36), 86 (15), 87 (11), 88 (2), 89 (6), 90 (7), 92 (3), 93, 94, 95.
kg.: 3·0 (5), 3·5 (18), 4·0 (81), 4·5 (61), 5·0 (110), 5·5 (86), 6·0 (146), 6·5 (59), 7·0 (65), 7·5 (29), 8·0 (29), 8·5 (5), 9·0 (4), 9·5.

4.2+: 115 Ind. (12 ♂, 103 ♀). Av. **78·1** (♂♂: 79·9, ♀♀: 77·7) cm., **5·6** (♂♂: 5·6, ♀♀: 5·6) kg.
cm.: 65, 68, 71 (2), 72 (4), 73 (7), 74 (2), 75 (10), 76 (3), 77 (7), 78 (10), 79 (10), 80 (9), 81 (14), 82 (18), 83 (6), 84 (3), 85 (6), 89 (2).
kg.: 2·5, 3·5 (2), 4·0 (12), 4·5 (9), 5·0 (13), 5·5 (17), 6·0 (28), 6·5 (18), 7·0 (12), 7·5 (2), 8·0.

5.2+: 2 ♀: 83, 85 cm., 6·0, 7·5 kg.

2.3: 9 Ind. (4 ♂, 5 ♀). Av. **102·0** (♂♂: 105·7, ♀♀: 99·0) cm., **12·7** (♂♂: 13·3, ♀♀: 12·3) kg.
cm.: 91, 97, 99, 100, 101, 102, 103, 106, 119.
kg.: 10·0, 11·0, 12·0 (2), 13·0, 13·5 (2), 14·0, 15·5.

3.3: 704 Ind. (205 ♂, 499 ♀). Av. **99·3** (♂♂: 101·3, ♀♀: 98·5) cm., **11·7** (♂♂: 12·4, ♀♀: 11·2) kg.
cm.: 80, 82 (2), 83, 84, 85 (2), 86 (3), 87 (4), 88 (3), 89 (11), 90 (25), 91 (5), 92 (20), 93 (21), 94 (23), 95 (35), 96 (28), 97 (30), 98 (51), 99 (63), 100 (112), 101 (40), 102 (35), 103 (38), 104 (36), 105 (47), 106 (16), 107 (17), 108 (13), 109 (8), 110 (5), 111 (3), 112 (2), 113, 114 (2), 119.
kg.: 6·0, 6·5 (2), 7·0 (8), 7·5 (7), 8·0 (23), 8·5 (12), 9·0 (43), 9·5 (20), 10·0 (60), 10·5 (27), 11·0 (89), 11·5 (48), 12 0 (101), 12·5 (32), 13·0 (81), 13·5 (25), 14·0 (53), 14·5 (16), 15·0 (26), 15· (15), 16·0 (12), 17·0, 18·0, 18·5. 5

4.3: 154 Ind. (44 ♂, 110 ♀). Av.: **99·7** (♂♂: 102·9, ♀♀: 98·5) cm., **11·8** (♂♂: 12·8, ♀♀: 11·4) kg.
cm.: 87, 89, 90 (4), 91 (2), 92 (4), 93 (3), 94 (4), 95 (8), 96 (6), 97 (11), 98 (12), 99 (14), 100 (27), 101 (8), 102 (8), 103 (6), 104 (9), 105 (9), 106 (4), 107 (3), 108 (7), 109 (2), 110.
kg.: 7·0, 7·5, 8·0 (3), 8·5 (2), 9·0 (12), 9·5 (2), 10·0 (13), 10·5 (10), 11·0 (28), 11·5 (4), 12·0 (18), 12·5 (6), 13·0 (17), 13·5 (8), 14·0 (11), 14·5 (4), 15·0 (7), 15·5 (2), 16·0 (4), 17·5.

5.3: 3 ♀: 101, 104, 107 cm., — 11·5, 13·5, 14·0 kg.

2.4: 7 Ind. (4 ♂, 3 ♀). Av.: **110·7** (♂♂: 111·0, ♀♀: 110·3) cm., **16·86** (♂♂: 16·75, ♀♀: 17·0) kg.
cm.: 109 (3), 110 (2), 112, 116.
kg.: 15·0, 15·5, 16·0, 17·0, 17·5, 18·0, 19·0.

3.4: 120 Ind. (93 ♂, 27 ♀). Av.: **112·5** (♂♂: 113·5, ♀♀: 110·0) cm., **17·0** (♂♂: 17·3, ♀♀: 16·2) kg.
cm.: 106 (2), 107 (5), 108 (12), 110 (14), 111 (17), 112 (5), 113 (5), 114 (2), 115 (4), 116 (4), 117 (5), 118 (9), 119 (6), 120 (6), 121, 122.
kg.: 11·5, 12·0, 13·0, 13·5, 14·0 (10), 14·5 (6), 15·0 (9), 15·5 (3), 16·0 (11), 16·5 (4), 17·0 (20), 17·5 (3), 18·0 (16), 18·5 (4), 19·0 (12), 19·5, 20·0 (9), 21·0 (5), 22·0 (3).

4.4: 39 Ind. (34 ♂, 5 ♀). Av.: **112·9** (♂♂: 113·2, ♀♀: 111·4) cm., **17·4** (♂♂: 17·5, ♀♀: 16·5) kg.
cm.: 108 (2), 109 (3), 110 (8), 111 (2), 112 (7), 113, 114 (3), 115 (6), 116 (2), 118, 119 (2), 120 (2).
kg.: 13·5, 14·0 (3), 14·5, 15·0, 16·0 (9), 16·5, 17·0 (4), 17·5 (2), 18·0 (7), 18·5, 19·0 (3), 20·0 (2), 21·0 (4).

2.5: 1 ♂: 123 cm., 20·0 kg.
3.5: 2 ♂: 122, 123 cm., 21·0 and 21·5 kg.

Once spawned: **140** *Ind.*

5-year-olds:
3.1+G+: 2 ♂: 65, 70 cm., 3·3, 3·5 kg.
6-year-olds:
3.1+G1: 1 ♀: 88 cm., 8·0 kg.

Ind. = Individuals, Av. = Average.

7-year-olds:

3.1+G2: **21** Ind. (16 ♂, 5 ♀). Av.: **98·6** (♂♂: 99·06, ♀♀: 97·0) cm., **11·8** (♂♂: 12·3, ♀♀: 10·2) kg.
cm.: 90 (2), 93, 94, 96, 97 (2), 98 (3), 99 (3), 100 (2), 102 (2), 103, 104 (2), 107.
kg.: 7·5, 8·0 (2), 9·0 (3), 10·0, 11·0 ,12·0 (3), 13·0 (2), 13·5, 14·0 (4), 14·5, 15·0 (2).

3.2+G1: **25** Ind. (5 ♂, 20 ♀). Av.: **93·3** (♂♂: 90·8, ♀♀: 94·4) cm., **9·7** (♂♂: 9·1, ♀♀: 9·85) kg.
cm.: 80, 84, 87 (2), 88, 90 (4), 91 (2), 93 (2), 96, 97 (2), 98 (2), 99 (3), 100, 101, 102 (2).
kg.: 5·0, 7·0 (3), 7·5, 8·0 (5), 9·0 (2), 9·5, 10·0, 11·0 (2), 11·5 (2), 12·0 (4), 12·5, 13·0, 13·5.

3.3G+: **6** Ind. (1 ♂, 5 ♀). Av.: **102·0** (♂: 108·0, ♀♀: 100·8) cm., **12·6** (♂: 13·5, ♀♀: 12·4) kg.
cm.: 96, 98 (2), 105, 107, 108.
kg.: 8·5, 13·0 (2), 13·5 (2), 14·0.

8-year-olds:

4.1+G2: **5** Ind. (5 ♂). Av.: **103·6** cm., **13·1** kg.
cm.: 98, 99, 105, 107, 109.
kg.: 10·0, 11·5, 14·0, 15·0 (2).

3.2+G2: 1 ♂: 117 cm., 17·0 kg.

4.2+G1: **5** Ind. (2 ♂, 3 ♀). Av.: **94·8** (♂♂: 98·0, ♀♀: 92·7) cm., **9·8** (♂♂: 12·3, ♀♀: 8·2) kg.
cm.: 78, 93, 94, 103, 106.
kg.: 6·5, 8·0, 10·0, 11·0, 13·5.

3.3G1: **54** Ind. (10 ♂, 44 ♀). Av.: **103·9** (♂♂: 102·9, ♀♀: 104·1) cm., **13·4** (♂♂: 12·9, ♀♀: 13·5) kg.
cm.: 85, 93, 95, 96 (2), 97, 98 (2), 99 (2), 100 (6), 101, 102 (4), 103 (5), 104, 105 (2), 106, 107 (4), 108 (8), 109 (5), 110 (4), 112 (2), 113.
kg.: 8·0, 9·0, 9·5, 10·0, 10·5, 11·0 (6), 11·5 (4), 12·0 (4), 12·5 (2), 13·0 (5), 13·5, 14·0 (2), 14·5 (6), 15·0 (9), 15·5 (2), 16·0 (4), 16·5 (3), 18·0.

3.4G+: **5** Ind. (3 ♂, 2 ♀). Av.: **112·0** cm., **16·5** kg.
cm.: 110 (2), 111, 113, 116.
kg.: 13·0, 16·0, 17·0, 17·5, 19·0.

9-year-olds:

4.3G1: **7** Ind. (3 ♂, 4 ♀). Av.: **103·1** (♂♂: 105·7, ♀♀: 101·3) cm., **14·0** (♂♂: 14·7, ♀♀: 13·5) kg.
cm.: 84, 91, 102, 107, 112 (2), 114.
kg.: 9·0, 10·0, 14·0, 15·0, 16·0 (2), 18·0.

3.4G1: **7** Ind. (4 ♂, 3 ♀). Av.: **116·1** (♂♂: 117·3, ♀♀: 114·7) cm., **18·4** (♂♂: 18·9, ♀♀: 17·7) kg.
cm.: 110, 112, 115, 117 (2), 120, 122.
kg.: 16·0, 17·0, 18·0, 18·5, 19·0 (2), 21·0.

Twice spawned: **19** *Ind.*

8-year-olds:

3.2+G1G+: 1 ♂: 94 cm., 11·0 kg. — 1 ♀: 99 cm., 11·0 kg.

9-year-olds:

3.2+G1G1: **4** Ind. ♂ 116 cm., 16·5 kg., ♀♀: 100, 104, 115 cm. — 11·4, 16·0, 16·5 kg.

3.3G1G+: **2** ♀: 105, 106 cm., 13·0, 13·5 kg.

10-year-olds:

4.2+G1G1: 1 ♂: 110 cm., 12·0 kg.

3.3G1G1: **8** Ind. (1 ♂, 7 ♀). Av.: **111·3** cm., **15·3** kg.
cm.: 98, 104, 112, 113, 114, 115 (2), 120 (♂).
kg.: 11·0, 14·0, 14·5, 15·0, 15·5, 17·0, 17·5, 18·5.

11-year-olds:

4.3G1G1: 1 ♀: 102 cm., 11·0 kg.

3.4G1G1: 1 ♂: 120 cm., 20·0 kg.

1937: **341** Ind.

2.1+: **3** Ind. Av.: 55·3 cm., 1·93 kg.
cm.: 51, 53, 62. — kg.: 1·5, 1·6, 2·7.

3.1+: **55** Ind. Av.: **55·0** cm., **1·79** kg.
cm.: 45, 46, 50 (3), 51 (7), 52 (3), 53 (5), 54 (7), 55 (5), 56 (4), 57, 58 (6), 59 (3), 60 (6), 61, 62, 63.
kg.: 0·9, 1·2 (3), 1·3 (3), 1·4 (3), 1·5 (9), 1·6 (5), 1·7 (5), 1·8 (5), 2·0 (9), 2·2 (3), 2·3 (4), 2·4, 2·5 (2), 2·7, 2·9.

4.1+: **9** Ind. Av.: **55·0** cm., **1·82** kg.
cm.: 51 (2), 53 (2), 55, 56, 58 (2), 60.
kg.: 1·3 (2), 1·5 (2), 1·9, 2·1, 2·2 (2), 2·4.

2.2+: 1 ♂: 84 cm., 7·0 kg. — 1 ♀: 74 cm., 4·0 kg.

3.2+: **33** Ind. (12 ♂, 21 ♀). Av.: **77·1** (♂♂: 80·5, ♀♀: 75·1) cm., **5·45** (♂♂: 5·99, ♀♀: 5·14) kg.
cm.: 60, 65, 67, 70 (3), 71 (3), 73 (2), 75 (4), 76 (2), 77, 78, 79 (2), 80, 82, 83 (2), 84, 85 (2), 86, 87 (2), 88 (2).
kg.: 2·9, 3·1, 3·4, 3·7, 4·0 (4), 4·4 (2), 4·7, 5·0 (2), 5·2, 5·3, 5·4, 5·5 (2), 5·8, 6·0 (3), 6·4, 6·5 (2), 6·7, 6·9, 7·0 (3), 7·5 (3).

4.2+: **19** Ind. (4 ♂, 15 ♀). Av.: **77·2** (♂♂: 76·5, ♀♀: 77·3) cm., **5·42** (♂♂: 5·53, ♀♀: 5·39) kg.
cm.: 71 (2), 72, 73, 75 (4), 76 (2), 78 (2), 80 (4), 82, 84, 85.
kg.: 4·0, 4·2 (2), 4·5, 4·8, 5·0 (4), 5·5, 5·7, 5·8 (2), 5·9, 6·0, 6·5 (3), 7·0.

2.3: 1 ♂: 104 cm., 13·5 kg. — 1 ♀: 88 cm., 11·5 kg.

3.3: **91** Ind. (22 ♂, 69 ♀). Av.: **99·4** (♂♂: 103.45, ♀♀: 98·13) cm., **11·81** (♂♂: 13·1, ♀♀: 11·4) kg.
cm.: 88, 90 (3), 92, 93 (3), 94, 95 (8), 96 (4), 97 (5), 98 (13), 99 (11), 100 (11), 101 (4), 102 (3), 103 (4), 104 (11), 105, 106, 107, 108 (2), 109, 110, 113.
kg.: 7·5, 8·0 (4), 9·0 (2), 9·5 (4), 10·0 (5), 10·5 (4), 11·0 (10), 11·5 (9), 12·0 (20), 12·5 (8), 13·0 (8), 13·5 (3), 14·0 (6), 14·5 (5), 15·0, 16·5.

4.3: **36** Ind. (2 ♂, 34 ♀). Av.: **97·44** (♂♂: 108·5, ♀♀: 96·8) cm., **11·67** (♂♂: 14·25, ♀♀: 11·51) kg.
cm.: 83, 86, 90, 92, 93, 94 (3), 95 (4), 97 (7), 98 (2), 99 (2), 100 (6), 101 (2), 102, 104 (2), 107, 110.
kg.: 9·0 (2), 9·5, 10·0 (4), 10·5, 11·0 (8), 11·5 (5), 12·0 (2), 12·5 (6), 13·0 (2), 13·5 (2), 14·0, 15·0, 15·5.

5.3: 1 ♂: 104 cm., 15·5 kg. — 1 ♀: 97 cm., 10·5 kg.

3.4: **29** Ind. (22 ♂, 7 ♀). Av.: **111·34** (♂♂: 111·77, ♀♀: 110·0) cm., **16·65** (♂♂: 16·78, ♀♀: 16·26) kg.
cm.: 103, 105, 106 (2), 108 (4), 109 (3), 110 (7), 111, 113 (3), 116, 117, 118 (4), 125.

kg.: 12·5, 13·0, 14·0, 14·5 (3), 15·0 (3), 16·0 (4), 16·5, 17·0 (5), 17·5, 18·0 (5), 19·0, 19·5, 20·0, 23·0.

4.4: **12** Ind. (10 ♂, 2 ♀). Av.: **112·58** (♂♂: 113·1, ♀♀: 111·0) cm., **16·49** (♂♂: 16·59, ♀♀: 16·0) kg.
cm.: 107, 109, 110 (2), 112, 113 (3), 115 (2), 116, 118.
kg.: 13·0, 14·0 (2), 14·5, 16·0, 16·5, 17·5 (2), 18·0, 18·5, 19·0, 19·5.

5.4: 2 ♂: 113, 114 cm., 17·0, 17·5 kg.

3.5: 2 ♂: 120, 123 cm., 20·0, 23·0 kg.

Once spawned: **39** *Ind.*

5-year-olds:
2.1+G1: 1 ♂: 78 cm., 5·8 kg.
3.1+G+: 2 ♂: 48 and 61 cm., 1·2 and 2·6 kg.

7-year-olds:
3.1+G2: 1 ♂: 93 cm., 9·5 kg., — 1 ♀: 87 cm., 8·5 kg.
4.1+G1: 1 ♂: 80 cm., 6·2 kg.

3.2+G1: **4** Ind. (2 ♂, 2 ♀). Av.: **93·5** (♂♂: 93·0, ♀♀: 94·0) cm., **9·25** (♂♂: 9·0, ♀♀: 9·5) kg.
cm.: 85, 92, 96, 101.
kg.: 7·0, 9·0, 10·0, 11·0.

4.2+G+: 1 ♂: 81 cm., 7·5 kg.

2.3G1: 1 ♀: 104 cm., 15·0 kg.
3.3G+: 1 ♂: 100 cm., 10·5 kg. — 1 ♀: 102 cm., 10·5 kg.

8-year-olds:
4.1+G2: 1 ♀: 93 cm., 8·5 kg.

4.2+G1: **4** Ind. (1 ♂, 3 ♀). Av.: **90·5** (♂: 80·0, ♀♀: 94·0) cm., **9·25** (♂: 8.0, ♀♀: 9·67) kg.
cm.: 80 (♂), 91 (2), 100.
kg.: 8·0 (♂), 8·5, 9·0, 11·5.

3.3G1: **10** Ind. (3 ♂, 7 ♀). Av.: **106·1** (♂♂: 108·0, ♀♀: 105·3) cm., **14·5** (♂♂: 15·3, ♀♀: 14·1) kg,
cm.: 99, 103, 104 (2), 106, 107, 109 (2), 110 (2),
kg.: 11·5, 12·0, 12·5, 14·5, 15·0 (2), 15·5 (2), 16·0. 17·5.

9-year-olds:
4.3G1: **7** Ind. (2 ♂, 5 ♀). Av.: **105·57** (♂♂: 102·5, ♀♀: 106·8) cm., **14·03** (♂♂: 13·0, ♀♀: 14·4) kg.
cm.: 102 (2), 103 (2), 109, 110 (2).
kg.: 11·0, 12·5, 13·0 (2), 15·0 (2), 18·5.

3.4G1: 3 ♂. Av.: **116·67** cm., **20·33** kg.
cm.: 114, 118 (2).
kg.: 18·0, 20·0, 23·0.

Twice spawned: **5** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♀: 107 cm., 13 kg.

10-year-olds:
4.1+G2+G1: 1 ♂: 115 cm., 17·5 kg.

3.3G1G1: **3** Ind. (1 ♂, 2 ♀). Av.: **109·33** (♂: 104·0, ♀♀: 112·0) cm., **15·0** (♂: 14·5, ♀♀: 15·25) kg.
cm.: 104, 110, 114.
kg.: 14·5 (2), 16·0.

1938: **541** Ind.

2.1+: **9** Ind. (4 ♂, 5 ♀). Av.: **55·78** (♂♂: 54·75, ♀♀: 56·60) cm., **1·91** (♂♂: 2·0, ♀♀: 1·84) kg.
cm.: 48, 52, 54, 55 (2), 58, 59, 60, 61.
kg.: 1·0 (2), 1·5, 2·0 (3), 2·5 (2), 2·7.

3.1+: **339** Ind. (166 ♂, 142 ♀, 31 undeterm.). Av.: **54·33** (♂♂: 55·80, ♀♀: 53·36) cm., **1·71** (♂♂: 1·84, ♀♀: 1·64) kg.
cm.: 43, 44 (2), 45 (6), 46 (7), 47 (15), 48 (9), 49 (6), 50 (44), 51 (21), 52 (25), 53 (19), 54 (17), 55 (40), 56 (16), 57 (15), 58 (15), 59 (16), 60 (31), 61 (11), 62 (6), 63 (6), 64 (4), 65 (3), 66, 68 (2), 69.
kg.: 0·8 (2), 0·9 (3), 1·0 (61), 1·1 (12), 1·2 (13), 1·3 (24), 1·4 (13), 1·5 (37), 1·6 (11), 1·7 (11), 1·8 (9), 1·9 (7), 2·0 (64), 2·1 (4), 2·2 (16), 2·3 (4), 2·4 (5), 2·5 (17), 2·7 (3), 2·8 (3), 29· (2), 3·0 (11), 3·1, 3·5 (5), 3·9.

4.1+: **51** Ind. (35 ♂, 14 ♀, 2 undeterm.). Av.: **57·04** (♂♂: 57·69, ♀♀: 56·79) cm., **1·97** (♂♂: 2·04, ♀♀: 1·96) kg.
cm.: 45, 48 (2), 49, 50 (3), 51 (5), 52 (3), 53 (2), 54, 55 (3), 57 (2), 58 (5), 59, 60 (4), 61 (4), 62 (5), 63 (5), 64, 65 (2), 67.
kg.: 0·8, 1·0 (7), 1·2 (3), 1·4, 1·5 (6), 1·7 (2), 2·0 (12), 2·2, 2·4 (3), 2·5 (5), 2·6, 2·7, 2·8 (2), 3·0 (5), 3·6.

2.2+: 1 ♂: 74 cm., 3·2 kg.
3.2+: **61** Ind. (17 ♂, 43 ♀). Av.: **82·02** (♂♂: 83·29, ♀♀: 81·37), **6·54** (♂♂: 6·86, ♀♀: 6·36) kg.
cm.: 71, 72, 73 (2), 74 (3), 75, 76, 77 (2), 78 (6), 79, 80 (6), 81 (3), 82 (4), 83 (4), 84 (4), 85 (5), 86, 87 (8), 88 (2), 89 (5), 93.
kg.: 4·0 (3), 4·4, 4·5 (3), 4·8, 5·0 (6), 5·1, 5·4, 5·5 (4), 5·6, 6·0, 6·5 (8), 7·0 (9), 7·2 (2), 7·3, 7·5 (5), 7·7, 8·0 (5), 8·2, 8·3, 8·5 (5), 9·0.
4.2+: **4** Ind. (2 ♂, 2 ♀). Av.: **81·75** cm., **6·8** (♂♂: 8·0, ♀♀: 3·7 and 7·5) kg.
cm.: 70, 83, 86, 88.
kg.: 3·7, 7·5, 8·0 (2).

2.3: **7** Ind. (1 ♂, 6 ♀). Av.: **98·14** (♀♀: 98·0) cm., **11·41** (♀♀: 11·48) kg.
cm.: 94 (3), 99 (♂), 101, 102, 103.
kg.: 10·0, 10·4, 11·0, 11·0 (♂), 12·0 (2), 13·5.
3.3: **30** Ind. (11 ♂, 19 ♀). Av.: **99·2** (♂♂: 102·73, ♀♀: 97·16) cm., **11·65** (♂♂: 12·46, ♀♀: 11·18) kg.
cm.: 86, 87, 88, 89, 95, 96 (3), 97 (2), 98, 99 (3), 100 (5), 101 (2), 102 (2), 105 (3), 107, 108, 109 (2).
kg.: 7·5, 8·0 (3), 9·0 (2), 10·0, 11·0 (4), 11·5, 12·0 (3), 12·2, 12·5 (2), 12·7, 13·0 (5), 13·1, 13·5 (2), 14·0, 14·5, 15·0.
4.3: **9** Ind. (1 ♂, 8 ♀). Av.: **100·11** (♀♀: 99·25) cm., **11·94** (♀♀: 11·94) kg.
cm.: 93, 95, 98, 99, 101, 107 (♂), 108.
kg.: 11·0 (4), 12·0, 12·0 (♂), 13·0 (2), 13·5.

2.4: 1 Ind. (undeterm.) 118 cm., 20·0 kg.
3.4: **9** Ind. (8 ♂, 1 ♀). Av.: **113·56** (♂♂: 114·25) cm., **16·53** (♂♂: 17·13) kg.

cm.: 108 (♀), 110 (2), 114 (2), 115 (2), 117, 119.
kg.: 11·0 (♀), 15·0, 15·5, 16·0, 17·0 (2), 19·0 (2), 19·3.
4.4: 2 ♂: 112 and 118 cm., 16·0 and 19·0 kg.

Once spawned: **14** *Ind.*

7-year-olds:
3.1+G2: 1 ♂, 103 cm., 13·0 kg.

4.2+G+: 1 ♀, 85 cm., 7·0 kg.

8-year-olds:
4.2+G1: 1 ♂: 88 cm., 8·0 kg.
3.3G1: **6** Ind. (6 ♀). Av.: **104·33** cm., **13·78** kg.
cm.: 100, 103, 105 (3), 108.
kg.: 11·0, 11·7, 14·0 (2), 16·0 (2).

9-year-olds:
4.3G1: **4** Ind. (1 ♂, 3 ♀). Av.: **100·5** (♀♀: 104·3) cm., **11·88** (♀♀: 13·0) kg.
cm.: 89 (♂), 100, 105, 108.
kg.: 8·5 (♂), 12·0, 13·0, 14·0.
3·4G1: 1 ♂: 113 cm., 16·0 kg.

Twice spawned: **3** *Ind.*

10-year-olds:
3.3G1G1: 2 ♀: 105 and 109 cm., 15·0 and 17·5 kg.

11-year-olds:
4.3G1G1: 1 ♂: 103 cm., 13·5 kg.

Four times spawned: **1** *Ind.*

10-year-olds:
5.1+G+G+G+G+: 1 ♂: 97 cm., 10·0 kg.

1939: **2025** Ind.

2.1+: **111** Ind. Av.: **52·75** cm., **1·50** kg.
cm.: 45 (3), 46 (3), 47 (2), 48 (3), 49 (6), 50 (23), 51 (7), 52 (11), 53 (10), 54 (11), 55 (5), 56 (5), 57 (5), 58 (7), 59 (2), 60 (6), 61, 62.
kg.: 0·9, 1·0 (22), 1·1, 1·2 (13), 1·3 (9), 1·4 (8), 1·5 (16), 1·6 (5), 1·7 (5), 1·8 (6), 1·9 (4), 2·0 (8), 2·1, 2·2 (5), 2·4, 2·5 (3), 2·7 (2).
3.1+: **1342** Ind. Av.: **53·99** cm., **1·61** kg.
cm.: 44 (7), 45 (12), 46 (17), 47 (22), 48 (26), 49 (58), 50 (175), 51 (92), 52 (149), 53 (104), 54 (111), 55 (97), 56 (72), 57 (73), 58 (90), 59 (83), 60 (93), 61 (29), 62 (21), 63 (7), 64, 65 (2), 69.
kg.: 0·7 (2), 0·8 (3), 0·9 (8), 1·0 (208), 1·1 (28), 1·2 (108), 1·3 (91), 1·4 (66), 1·5 (208), 1·6 (66), 1·7 (92), 1·8 (62), 1·9 (45), 2·0 (158), 2·1 (25), 2·2 (41), 2·3 (18), 2·4 (13), 2·5 (60), 2·6 (9), 2·7 (11), 2·8 (6), 2·9 (5), 3·0 (8), 3·1.
4.1+: **189** Ind. Av.: **52·91** cm., **1·47** kg.
cm.: 44, 46 (2), 47 (6), 48 (7), 49 (13), 50 (25), 51 (21), 52 (19), 53 (21), 54 (16), 55 (17), 56 (6), 57 (13), 58 (4), 59 (6), 60 (8), 61 (3), 62.
kg.: 0·8, 1·0 (39), 1·1 (4), 1·2 (21), 1·3 (19), 1·4 (6), 1·5 (38), 1·6 (10), 1·7 (6), 1·8 (7), 1·9 (4), 2·0 (23), 2·1, 2·2 (4), 2·3 (3), 2·4, 2·5, 2·6.
5.1+: 2 Ind.: cm.: 45, 46. — kg.: 1·0 (2).

2.2+: 2 ♀: 81 and 87 cm., 5·0 and 8·0 kg.
3.2+: **216** Ind. (34 ♂, 182 ♀). Av.: **81·13** (♂♂: 84·59, ♀♀: 80·48) cm., **6·22** (♂♂: 7·02, ♀♀: 6·07) kg.
cm.: 64, 65, 69 (3), 70 (2), 71 (5), 72 (2), 73 (2), 74 (8), 75 (23), 76 (6), 77 (3), 78 (15), 79 (12), 80 (24), 81 (14), 82 (14), 83 (4), 84 (14), 85 (11), 86 (6), 87 (7), 88 (7), 89 (8), 90 (16), 91, 92 (4), 93, 95 (2).
kg.: 3·5 (6), 4·0 (15), 4·5 (21), 5·0 (24), 5·5 (20), 6·0 (32), 6·5 (22), 7·0 (21), 7·5 (10), 8·0 (18), 8·5 (17), 9·0 (9), 9·5.
4.2+: **16** Ind. (1 ♂, 15 ♀). Av.: **81·56** (♀♀: 81·13) cm., **6·07** (♀♀: 6·01) kg.
cm.: 74, 76, 77, 80 (3), 81 (3), 82 (2), 83, 84, 87, 88 (♂), 89.
kg.: 3·5, 4·4, 5·0 (3), 5·5, 5·7, 6·0 (4), 7·0, 7·0 (♂), 7·5, 8·0, 9·5.

2.3: 2 ♀: 102 and 104 cm., 13·5 and 14·5 kg.
3.3: **89** Ind. (26 ♂, 63 ♀). Av.: **101·27** (♂♂: 102·46, ♀♀: 100·78) cm., **12·49** (♂♂: 13·40, ♀♀: 12·12) kg.
cm.: 87, 90, 93 (2), 94 (3), 95 (7), 96 (3), 97 (4), 98 (9), 99, 100 (12), 101 (5), 102 (4), 103 (3), 104 (7), 105 (7), 106 (2), 107 (7), 108 (5), 109, 110 (4), 111.
kg.: 8·5 (2), 9·0 (3), 9·5, 10·0 (8), 10·5 (2), 11·0 (5), 11·5 (12), 12·0 (9), 12·5 (5), 13·0 (12), 13·5 (10), 14·0 (4), 14·5 (5), 15·0 (3), 15·5 (2), 16·0 (2), 16·5 (3), 17·0.
4.3: 1 ♀: 108 cm., 13·0 kg.

2.4: 2 ♂: 110 and 112 cm., 15·5 and 16·0 kg.
3.4: **17** Ind. (15 ♂, 2 ♀). Av.: **14·59** (♂♂: 112·18) cm., **16·24** (♂♂: 16·3) kg.
cm.: 107 (♀), 108 (♀), 108 (3), 110 (3), 111 (2), 112 (2), 113, 114, 117, 118, 120.
kg.: 13·5 (♀), 13·5, 15·0 (3), 16·0 (2), 16·5 (3), 17·0 (4), 18·0 (♀), 18·0, 18·5.
4.4: 1 ♀: 118 cm., 17·5 kg.

4.5: 1 ♂: 125 cm., 20·0 kg.

Once spawned: **27** *Ind.*

6-year-olds:
3.1+G1+: **5** Ind. (4 ♂, 1 ♀). Av.: **87·6** (♂♂: 90·5) cm., **8·08** (♂♂: 8·63) kg.
cm.: 76 (♀), 87, 90 (2), 95.
kg.: 5·9 (♀), 8·5 (3), 9·0.

7-year-olds:
3·1+G2: 3 Ind. (2 ♂, 1 ♀). Av.: **105·67** cm., **14.33** kg.
cm.: 102, 105 (♀), 110.
kg.: 12·5, 15·0 (♀), 15·5.
4.1+G1: 1 ♀: 82 cm., 6·5 kg.

3.3G+: 2 ♂, 1 ♀: cm.: 100 (♀), 105, 110.
kg.: 12·5, 13·0 (♀), 16·5.

8-year-olds:
4.2+G1: 2 ♀: 88 and 95 cm., 7·0 and 10·0 kg.

3.3G1: **8** Ind. (1 ♂, 7 ♀). Av.: **105·63** (♀♀: 104·42) cm., **14.5** (♀♀: 14·14) kg.
cm.: 100 (3), 105, 108 (2), 110, 114 (♂).
kg.: 10·0, 13·5, 14·5 (2), 15·5 (3), 17·0 (♂).

9-year-olds:
4.3G1: **4** ♀; Av.: **107·0** cm., **12.5** kg.
cm.: 105, 106, 108, 109.
kg.: 11·5 (2), 13·0, 14·0.

3.4G1: 1 ♀: 114 cm., 15·0 kg.

Twice spawned: **7** *Ind.*

9-year-olds:
2.3G1G1: 1 ♀: 107 cm., 13·5 kg.

10-year-olds:
3.3G1G1: **5** ♀. Av.: **110·6** cm., **14·84** kg.
cm.: 108, 110, 111 (2), 113.
kg.: 12·2, 15·0, 15·5 (2), 16·0.

11-year-olds:
4.3G1G1: 1 ♀: 110 cm., 13·0 kg.

1940: **2497** Ind.

2.1+: **14** Ind. Av.: **48·57** cm., **1·39** kg.
cm.: 45 (3), 47 (3), 49 (2), 50 (4), 51, 55.
kg.: 1·0, 1·1, 1·2 (3), 1·3 (3), 1·4, 1·5, 1·7 (2), 1·8 (2).

3.1+: **298** Ind. Av.: **47.82** cm., **1·21** kg.
cm.: 40 (2), 42 (2), 43 (13), 44 (24), 45 (64), 46 (7), 47 (55), 48 (14), 49 (24), 50 (52), 51 (3), 52 (8), 53 (2), 54 (4), 55 (19), 60 (5).
kg.: 0·5 (3), 0·6 (5), 0·7 (10), 0·8 (16), 0·9 (18), 1·0 (56), 1·1 (18), 1·2 (70), 1·3 (23), 1·4 (13), 1·5 (29), 1·6 (6), 1·7 (7), 1·8 (8), 1·9 (2), 2·0 (6), 2·1 (4), 2·2 (3), 2·3.

4.1+: **16** Ind. Av.: **47·63** cm., **1·23** kg.
cm.: 43, 45 (5), 47 (2), 48 (3), 50 (3), 51, 55.
kg.: 0·8, 0·9, 1·0 (2), 1·1 (2), 1·2 (5), 1·3, 1·5 (3), 1·9.

2.2+: **78** Ind. (12 ♂, 66 ♀). Av.: **74·90** (♂♂: 77·5, ♀♀: 74·42) cm., **4·73** (♂♂: 4·98, ♀♀: 4·68) kg.
cm.: 65 (3), 67, 68, 69, 70 (11), 71 (2), 72 (2), 73 (2), 74 (3), 75 (25), 76 (2), 77 (6), 78 (4), 79 (3), 80 (6), 82 (3), 85 (3).
kg.: 3·0 (2), 3·5 (8), 4·0 (13), 4·5 (23), 5·0 (16), 5·5 (3), 6·0 (7), 6·5 (2), 7·0 (3), 7·5.

3.2+: **1194** Ind. (256 ♂, 938 ♀). Av.: **76·59** (♂♂: 78·88, ♀♀: 75·96) cm., **5·11** (♂♂: 5·63, ♀♀: 4·97) kg.
cm.: 60 (5), 63, 64 (2), 65 (12), 66, 67 (4), 68 (3), 69 (14), 70 (97), 71 (30), 72 (57), 73 (51), 74 (30), 75 (285), 76 (46), 77 (41), 78 (116), 79 (56), 80 (152), 81 (28), 82 (33), 83 (23), 84 (14), 85 (71), 86 (4), 87 (3), 88 (3), 89, 90 (3), 91.
kg.: 2·5 (4), 3·0 (22), 3·5 (66), 4·0 (146), 4·5 (214), 5·0 (291), 5·5 (135), 6·0 (168), 6·5 (49), 7·0 (63), 7·5 (17), 8·0 (10), 8·5 (5), 9·0 (2), 9·5, 10·0.

4.2+: **212** Ind. (36 ♂, 176 ♀). Av.: **76·79** (♂♂: 78·69, ♀♀: 76·40) cm., **5·07** (♂♂: 5·58, ♀♀: 4·97) kg.
cm.: 60, 65 (3), 67, 69 (2), 70 (10), 71 (9), 72 (6), 73 (8), 74 (6), 75 (51), 76 (13), 77 (11), 78 (20), 79 (8), 80 (30), 81 (6), 82 (6), 83 (2), 84 (2), 85 (14), 87, 89, 90.
kg.: 3·0 (2), 3·5 (9), 4·0 (30), 4·5 (41), 5·0 (61), 5·5 (24), 6·0 (16), 6·5 (10), 7·0 (14), 7·5 (3), 8·0 (2).

5.2+: 1 ♂: 75 cm., 4·2 kg. — 1 ♀: 80 cm., 5·0 kg.

2.3: **20** Ind. (3 ♂, 17 ♀). Av.: **98·9** (♂♂: 104·0, ♀♀: 98·0) cm., **11·99** (♂♂: 13·17, ♀♀: 11·78) kg.
cm.: 89, 95 (4), 96, 97, 98, 99 (3), 100 (5), 103, 104, 105, 109.
kg.: 9·0, 10·0 (3), 10·5 (2), 11·0, 11·5, 12·0 (2), 12·5 (2), 13·0 (6), 14·5, 16·0.

3.3: **410** Ind. (120 ♂, 290 ♀). Av.: **100·09** (♂♂: 103·71, ♀♀: 98·59) cm., **11·84** (♂♂: 12·86, ♀♀: 11·42) kg.
cm.: 85, 87, 88 (3), 89 (2), 90 (9), 91 (3), 92 (5), 93 (4), 94 (8), 95 (34), 96 (8), 97 (22), 98 (35), 99 (46), 100 (78), 101 (13), 102 (20), 103 (19), 104 (22), 105 (35), 106 (4), 107 (4), 108 (17), 109 (3), 110 (12), 115, 116.
kg.: 7·0 (4), 7·5, 8·0 (2), 8·5 (3), 9·0 (21), 9·5 (11), 10·0 (38), 10·5 (17), 11·0 (67), 11·5 (29), 12·0 (78), 12·5 (13), 13·0 (49), 13·5 (13), 14·0 (27), 14·5 (9), 15·0 (15), 15·5 (3), 16·0 (6), 16·5, 17·0 (2), 19·0.

4.3: **70** Ind. (13 ♂, 57 ♀). Av.: **99·74** (♂♂: 103·22, ♀♀: 98·95) cm., **11·59** (♂♂: 12·92, ♀♀: 11·29) kg.
cm.: 90, 92, 93 (3), 95 (5), 96 (2), 97 (5), 98 (8), 99 (9), 100 (15), 101 (2), 102 (3), 103 (3), 104 (3), 105 (7), 109, 110, 111.
kg.: 8·0 (2), 8·5, 9·0, 9·5 (5), 10·0 (9), 10·5 (5), 11·0 (12), 11·5 (5), 12·0 (9), 12·5 (2), 13·0 (8), 13·5, 14·0 (3), 14·5 (2), 15·0 (4), 17·0.

5.3: 1 ♂: 99 cm., 12·4 kg.

2.4: 1 ♂: 120 cm., 20·0 kg.

3.4: **69** Ind. (65 ♂, 4 ♀). Av.: **114·99** (♂♂: 115·15, ♀♀: 112·25) cm., **17·0** (♂♂: 17·08, ♀♀: 15·63) kg.
cm.: 101, 105, 108 (4), 110 (9), 111 (3), 112 (2), 113 (2), 114 (2), 115 (22), 116 (3), 117 (2), 118 (3), 120 (6), 121 (2), 122, 123 (2), 124, 125 (3).
kg.: 14·0, 15·0 (9), 15·5, 16·0 (7), 16·5 (11), 17·0 (17), 17·5 (3), 18·0 (9), 18·5, 19·0 (6), 19·5 (2), 20·0 (2).

4.4: **5** Ind. (4 ♂, 1 ♀). Av.: **117·0** (♂♂: 117·5) cm., **16·6** (♂♂: 16·6) kg.
cm.: 114, 115 (♀), 115, 116, 125.
kg.: 15·5, 16·0, 16·5, 17·0 (♀), 18·0.

3.5: 2 ♂: 112 and 125 cm., both 18·0 kg.

Once spawned: **96** *Ind.*

5-year-olds:
2.1+G1: 1 ♂: 82 cm., 5·8 kg.
3.1+G+: **11** Ind. (8 ♂, 3 ♀). Av.: **67·09** (♂♂: 66·0, ♀♀: 70·0) cm., **3·29** (♂♂: 3·25, ♀♀: 3·40) kg.
cm.: 58, 65 (5), 70 (4), 75.
kg.: 2·5, 2·7 (2), 2·9, 3·0 (3), 3·5, 3·9, 4·5 (2).

6-year-olds:
3.1+G1: **14** Ind. (4 ♂, 10 ♀). Av.: **77·64** (♂♂: 80·5, ♀♀: 76·5) cm., **5·19** (♂♂: 5·40, ♀♀: 5·11) kg.
cm.: 70, 73, 75 (4), 77, 78, 80 (3), 82 (2), 85.
kg.: 4·0, 4·3, 4·5, 4·9, 5·0 (2), 5·1, 5·2 (2), 5·5, 6·0 (4).

4.1+G+: 1 ♀: 75 cm., 4·9 kg.

3.2+G+: 1 ♀: 82 cm., 6·0 kg.

7-year-olds:

3.1+G2: **4** Ind. (3 ♂, 1 ♀). Av.: **101·25** (♂♂: 103·33) cm., **12·30** (♂♂: 12·73) kg.
cm.: 95 (♀), 101, 104, 105.
kg.: 11·0 (♀), 12·0, 12·2, 14·0.

4.1+G1: 2 ♂: 75 and 89 cm., 5·0 and 9·0 kg.

3.2+G1: **31** Ind. (2 ♂, 29 ♀). Av.: **94·87** (♀♀: 94·86) cm., **9·91** (♀♀: 9·84) kg.
cm.: 81, 83, 84, 88 (2), 90 (3), 91, 93 (3), 94, 95 (4), 97 (2), 98 (5), 99 (2), 101, 103, 104 (2), 109 (♂).
kg.: 5·8, 6·0, 7·0, 7·5 (2), 7·8, 8·0, 8·5 (3), 9·0 (3), 9·5, 10·0 (3), 10·5, 11·0 (5), 11·5 (2), 12·0 (3), 12·5, 14·0 (♂), 15·0.

3.3G+: 2 ♀: 92 and 100 cm., 9·0 and 10·0 kg.

8-year-olds:

3.1+G3: 1 ♂: 110 cm., 15·0 kg.
4.1+G2: 1 ♂: 110 cm., 14·0 kg.

4.2+G1: 4 ♀. Av.: **91·75** cm., **8·23** kg.
cm.: 87, 92, 93, 95.
kg.: 7·0 (2), 8·9, 10·0.

3.3G1: **18** Ind. (4 ♂, 14 ♀). Av.: **104·78** (♂♂: 114·5, ♀♀: 102·0) cm., **12·96** (♂♂: 15·5, ♀♀: 12·23) kg.
cm.: 95, 98, 99 (2), 100 (3), 101, 104 (3), 105, 109, 110 (2), 115 (2), 118.
kg.: 10·0 (3), 11·5 (2), 12·0, 12·2, 12·5 (2), 13·0 (4), 14·0, 15·0 (2), 16·0, 19·0.

9-year-olds:

4.3G1: **5** Ind. (1 ♂, 4 ♀). Av.: **107·4** (♀♀: 104·25) cm., **14.3** (♀♀: 13·25) kg.
cm.: 100, 105 (2), 107, 120 (♂).
kg.: 12·0, 12·5, 13·5, 15·0, 18·5 (♂).

Twice spawned: **9** *Ind.*

8-year-olds:

3.3G+G+: 1 ♂: 120 cm., 18·0 kg. — 1 ♀: 110 cm., 11·5 kg.

9-year-olds:

3.2+G1G1: **5** Ind. (1 ♂, 4 ♀). Av.: **105·0** (♀♀: 102·25) cm., **13·7** (♀♀: 12·63) kg.
cm.: 100, 103 (3), 116 (♂).
kg.: 10·5, 12·5, 13·0, 14·5, 18·0 (♂).

10-year-olds:

3.3G1G1: 2 ♂: 110 and 118 cm., 16·5 and 17·5 kg.

1941: **845** Ind.

2.1+: **5** Ind. Av.: **45·8** cm., **1·06** kg.
cm.: 42, 44, 46, 47, 50.
kg.: 0·8, 1·0 (3), 1·5.

3.1+: **109** Ind. Av.: **46·15** cm., **1·13** kg.
cm.: 40 (17), 42 (2), 43 (4), 44, 45 (42), 46 (3), 47 (6), 48 (8), 49 (4), 50 (9), 52 (3), 53 (2), 56 (6), 58, 60.
kg.: 0·7 (8), 0·8 (13), 0·9 (13), 1·0 (27), 1·1 (4), 1·2 (13), 1·3 (8), 1·4, 1·5 (8), 1·6 (4), 1·7 (3), 1·8 (3), 2·0 (2), 2·1 (2).

4.1+: **11** Ind. Av.: **48·27** cm., **1·19** kg.
cm.: 43, 45 (4), 47 (2), 50, 51, 55, 58.
kg.: 0·8 (2), 0·9 (2), 1·0, 1·2 (2), 1·4, 1·5, 1·6, 1·8.

5.1+: 1 Ind. 55 cm., 1·3 kg.

2.2+: **16** Ind. (4 ♂, 12 ♀). Av.: **72·06** (♂♂: 75·25, ♀♀: 71·0) cm., **4·12** (♂♂: 4·73, ♀♀: 3·92) kg.
cm.: 67, 70 (7), 71 (2), 73, 75 (4), 81.
kg.: 3·2, 3·5 (4), 3·6, 3·7, 4·0 (2), 4·5 (4), 4·8, 5·1, 5·5.

3.2+: **201** Ind. (76 ♂, 125 ♀). Av.: **72·22** (♂♂: 73·55, ♀♀: 71·42) cm., **4·23** (♂♂: 4·61, ♀♀: 4·0) kg.
cm.: 52, 57, 60 (2), 63 (3), 64 (3), 65 (7), 66 (2), 67 (6), 68 (6), 69 (7), 70 (46), 71 (14), 72 (17), 73 (11), 74 (5), 75 (32), 76 (4), 77 (3), 78 (4), 79, 80 (12), 81, 82, 83, 84 (2), 85 (3).
kg.: 2·5 (5), 3·0 (30), 3·5 (38), 4·0 (44), 4·5 (27), 5·0 (25), 5·5 (13), 6·0 (9), 6·5 (4), 7·0 (4), 7·5 (2).

4.2+: **22** Ind. (7 ♂, 15 ♀). Av.: **74·27** (♂♂: 73·43, ♀♀: 74·67) cm., **4·43** (♂♂: 4·56, ♀♀: 4·14) kg.
cm.: 66, 69, 70, 71, 72 (4), 73, 75 (7), 76, 78, 83, 84.
kg.: 3·0 (2), 3·5, 3·9, 4·0 (7), 4·3, 4·5 (2), 4·6, 5·0 (3), 5·1, 5·5, 6·0, 6·5.

2.3: **41** Ind. (7 ♂, 34 ♀). Av.: **96·9** (♂♂: 101·0, ♀♀: 96·06) cm., **10·67** (♂♂: 12·86, ♀♀: 10·22) kg.
cm.: 81, 90 (3), 91 (2), 92, 93, 94, 95 (12), 96, 97 (3), 99 (4), 100 (5), 101, 103 (3), 108, 110 (2).
kg.: 6·5, 8·0 (2), 8·5, 9·0 (7), 9·5 (3), 10·0 (6), 10·5 (3), 11·0 (2), 11·5 (5), 12·0 (2), 12·5, 13·0 (5), 13·5, 14·0, 15·0.

3.3: **383** Ind. (103 ♂, 280 ♀). Av.: **98·23** (♂♂: 102·64, ♀♀: 96·60) cm., **11·21** (♂♂: 12·76, ♀♀: 10·64) kg.
cm.: 75, 80 (2), 85 (4), 86 (2), 87, 88, 89 (2), 90 (19), 91 (9), 92 (9), 93 (7), 94 (5), 95 (72), 96 (12), 97 (19), 98 (23), 99 (36), 100 (63), 101 (11), 102 (16), 103 (6), 104 (10), 105 (24), 106 (4), 107 (3), 108 (3), 109 (6), 110 (8), 111 (2), 114, 115 (2).
kg.: 7·0 (6), 7·5 (2), 8·0 (16), 8·5 (8), 9·0 (29), 9·5 (25), 10·0 (45), 10·5 (21), 11·0 (55), 11·5 (32), 12·0 (40), 12·5 (21), 13·0 (24), 13·5 (20), 14·0 (17), 14·5 (5), 15·0 (10), 15·5 (2), 16·0, 16·5 (2), 17·0 (2).

4.3: **27** Ind. (10 ♂, 17 ♀). Av.: **98·37** (♂♂: 103·0, ♀♀: 95·65) cm., **11·63** (♂♂: 12·19, ♀♀: 11·30) kg.
cm.: 83, 90 (4), 93, 94, 95, 96 (3), 97, 98, 99, 100 (5), 101, 105 (3), 106, 108, 109, 110.
kg.: 6·4, 8·5 (3), 8·7, 10·0, 10·5, 11·0 (4), 11·5 (2), 12·0 (4), 12·5, 13·0, 13·5 (2), 14·0 (2), 14·4, 15·0, 15 5.

3.4: **22** Ind. (18 ♂, 4 ♀). Av.: **115·27** (♂♂: 115·89, ♀♀: 112·5) cm., **17·16** (♂♂: 17·28, ♀♀: 16·63) kg.
cm.: 109, 111 (3), 114 (3), 115 (10), 119, 120 (3), 123.
kg.: 13·0, 13·5 (2), 15·0 (2), 16·0 (2), 16·5, 17·0 (2), 17·5, 18·0 (4), 18·5, 19·0 (4), 20·0, 21·0.

4.4: **4** Ind. (3 ♂, 1 ♀). Av.: **115·25** (♂♂: 117·67) cm., **16·75** (♂♂: 17·33) kg.
cm.: 108 (♀), 115, 118, 120.
kg.: 15·0 (♀), 16·0, 18·0 (2).

3.5: 3 ♂: cm.: 123, 125 (2).
kg.: 17·0, 19·0 (2).

Once spawned: **52** *Ind.*

6-year-olds:

3.1+G1: **18** Ind. (11 ♂, 7 ♀). Av.: **82·89** (♂♂: 84·18, ♀♀: 80·86) cm., **6·62** (♂♂: 7·22, ♀♀: 5·67) kg.
cm.: 75 (2), 76, 80 (4), 81 (3), 84, 85 (2), 86, 88, 90, 91, 94.
kg.: 4·5, 4·7, 4·9, 5·0 (2), 5·5 (2), 5·6, 6·5 (2), 7·0 (2), 7·5, 7·9, 8·0, 8·5, 9·5, 10·0.

7-year-olds:

3.1+G2: 3 ♂: cm.: 98, 103, 105. Av.: **102·0**.
kg.: 12·0, 13·5, 15·0. Av.: **13·5**.

4.1+G1: 1 ♂: 70 cm., 4·7 kg. — 1 ♀: 70 cm., 3·9 kg.

3.2+G1: **13** Ind. (1 ♂, 12 ♀). Av.: **95·85** (♀♀: 96·42) cm., **10·34** (♀♀: 10·58) kg.
cm.: 86, 89, 89 (♂), 90, 95 (2), 98 (4), 100 (2), 110.
kg.: 4·9, 7·0, 7·5, 7·5 (♂), 8·5, 10·5, 11·0, 12·0 (2), 13·0 (2), 13·5, 14·0.

2.3G1: 2 ♂: 110 and 115 cm., 16·0 and 17·0 kg.

3.3G+: 1 ♂: 104 cm., 11·0 kg. — 1 ♀: 106 cm., 13·5 kg.

8-year-olds:

3.3G1: **12** Ind. (4 ♂, 8 ♀). Av.: **112·5** (♂♂: 115·0, ♀♀: 111·25) cm., **15·46** (♂♂: 16·38, ♀♀: 15·0) kg.
cm.: 110 (6), 114, 115 (4), 116.
kg.: 13·5 (2), 14·5, 15·0 (3), 16·0 (3), 16·5, 17·0, 17·5.

Twice spawned: **2** *Ind.*

9-year-olds:

3.2+G1G1: 1 ♀: 100 cm., 11·5 kg.

10-year-olds:

3.3G1G1: 1 ♂: 120 cm., 17·5 kg.

1942. 2248 Ind.

3+: 1 Ind. 45 cm., 0·6 kg.

3.1+: **18** Ind. Av.: **49·11** cm., **1·24** kg.
cm.: 39, 40, 43, 45 (5), 46, 49, 50, 54, 55 (3), 57, 58 (2).
kg.: 0·7 (4), 0·8, 1·0 (5), 1·3 (2), 1·7, 1·8 (2), 1·9 (2), 2·0.

4.1+: **4** Ind. Av.: **59·5** cm., **2·1** kg.
cm.: 55, 58, 60, 65.
kg.: 1·7, 2·0, 2·2, 2·5.

2.2+: **44** Ind. (27 ♂, 17 ♀). Av.: **69·05** (♂♂: 69·93, ♀♀: 67·65) cm., **3·35** (♂♂: 3·4, ♀♀: 3·28) kg.
cm.: 58 (2), 60 (3), 61, 63 (3), 64 (2), 65 (10), 66, 68, 69, 70 (5), 72, 73, 74, 75 (3), 76 (2), 78 (2), 80 (3), 84, 85.
kg.: 1·9, 2·0 (2), 2·3, 2·4, 2·5 (8), 2·6 (2), 2·8, 3·0 (7), 3·3 (2), 3·4, 3·5 (3), 4·0 (6), 4·1 (3), 4·5 (2), 5·0, 5·2, 5·8, 6·0.

3.2+: **595** Ind. (171 ♂, 282 ♀, 142 undeterm.). Av.: **70·26** (♂♂: 72·17, ♀♀: 70·87) cm., **3·56** (♂♂: 3·85, ♀♀: 3·60) kg.
cm.: 50, 54 (2), 55 (8), 57, 58 (4), 59 (9), 60 (53), 61 (3), 62 (6), 63 (8), 64 (5), 65 (93), 66 (3), 67 (15), 68 (21), 69 (12), 70 (101), 71 (10), 72 (19), 73 (10), 74 (18), 75 (69), 76 (3), 77 (5), 78 (12), 79 (10), 80 (70), 81 (3), 82 (5), 83 (7), 84 (3), 85 (4), 86 (2).
kg.: 1·5 (3), 2·0 (38), 2·5 (72), 3·0 (128), 3·5 (109), 4·0 (119), 4·5 (60), 5·0 (41), 5·5 (18), 6·0 (7),

4.2+: **51** Ind. (9 ♂, 42 ♀). Av.: **69·92** (♂♂: 66·44, ♀♀: 70·67) cm., **3·48** (♂♂: 3·11, ♀♀: 3·56) kg.
cm.: 58 (2), 59, 60 (3), 61, 62, 65 (12), 68, 69, 70 (8), 71, 72 (2), 74, 75 (10), 78, 80 (2), 81, 83, 85 (2),
kg.: 2·0, 2·5 (9), 3·0 (13), 3·5 (8), 4·0 (13), 4·5 (4), 5·0, 5·5, 6·0.

2.3: **150** Ind. (38 ♂, 112 ♀). Av.: **92·91** (♂♂: 97·39, ♀♀: 91·39) cm., **8·85** (♂♂: 10·25, ♀♀: 8·37) kg.
cm.: 75, 80 (2), 83 (3), 84 (2), 85 (15), 86 (2), 87 (9), 88 (4), 89 (5), 90 (16), 91, 92 (5), 93 (6), 94 (9), 95 (27), 96 (2), 97 (9), 98 (8), 99 (4), 100 (8), 101, 102, 103, 104 (5), 105 (2), 108, 109.
kg.: 4·5, 5·0, 5·5 (3), 5·8, 6·0 (11), 6·2 (2), 6·5 (6), 7·0 (13), 7·5 (11), 8·0 (9), 8·5 (6), 9·0 (17), 9·5 (13), 10·0 (27), 10·5 (9), 11·0 (6), 11·5, 12·0 (7), 12·5 (2), 13·0 (2), 13·5, 14·5.

3.3: **1150** Ind. (265 ♂, 885 ♀). Av.: **90·71** (♂♂: 94·26, ♀♀: 89·65) cm., **8·26** (♂♂: 9·33, ♀♀: 7·94) kg.
cm.: 70, 73, 74, 75 (11), 77, 78 (3), 79 (2), 80 (43), 81 (6), 82 (29), 83 (29), 84 (31), 85 (138), 86 (27), 87 (71), 88 (36), 89 (65), 90 (155), 91 (17), 92 (23), 93 (27), 94 (44), 95 (156), 96 (17), 97 (35), 98 (39), 99 (34), 100 (58), 101 (7), 102 (4), 103 (13), 104 (9), 105 (7), 107 (2), 108 (5), 109, 110, 115.
kg.: 4·0 (2), 4·5 (3), 5·0 (30), 5·5 (44), 6·0 (111), 6·5 (75), 7·0 (111), 7·5 (74), 8·0 (153), 8·5 (77), 9·0 (139), 9·5 (70), 10·0 (22), 10·5 (45), 11·0 (37), 11·5 (10), 12·0 (22), 12·5 (8), 13·0 (13), 13·5, 14·0 (2), 14·5.

4.3: **84** Ind. (21 ♂, 63 ♀). Av.: **90·45** (♂♂: 93·43, ♀♀: 89·46) cm., **8·16** (♂♂: 8·48, ♀♀: 8·05) kg.
cm.: 80 (4), 83 (4), 84 (3), 85 (10), 86 (3), 87 (5), 89, 90 (14), 91 (4), 93 (7), 95 (10), 96 (2), 97 (3), 98 (4), 99 (2), 100 (2).
kg.: 5·0 (3), 5·5 (2), 6·0 (6), 6·5 (6), 7·0 (10), 7·5 (6), 8·0 (8), 8·5 (9), 9·0 (15), 9·5 (6), 10·0 (7), 10·5 (2), 11·0 (2), 11·5, 12·0.

2.4: **19** Ind. (14 ♂, 5 ♀). Av.: **111.32** (♂♂: 113.29, ♀♀: 105·8) cm., **15·47** (♂♂: 16·10, ♀♀: 13·56) kg.
cm.: 100, 103, 108 (3), 110 (5), 112, 113, 114 (2), 115, 116, 118 (3).
kg.: 13·0 (2), 13·5 (3), 14·0, 14·5, 15·0 (2), 15·5, 16·0, 16·5, 17·0 (2), 17·5 (5).

3.4: **87** Ind. (77 ♂, 10 ♀). Av.: **113·32** (♂♂: 113·74, ♀♀: 110·10) cm., **16·05** (♂♂: 16·22, ♀♀: 14·70) kg.
cm.: 99, 101, 104, 105, 106, 107, 108 (5), 109 (2), 110 (14), 111 (4), 112 (7), 113 (4), 114 (5), 115 (17), 116 (2), 117, 118 (10), 119, 120 (7), 123 (2).
kg.: 11·5 (2), 12·0 (2), 12·5 (2), 13·0 (2), 13·5, 14·0 (5), 14·5 (5), 15·0 (10), 15·5 (6), 16·0 (11), 16·5 (6), 17·0 (9), 17·5 (8), 18·0 (10), 18·5 (5), 19·0, 19·5, 20·0.

4.4: 3 ♂: cm.: 115, 120, 123. Av.: **119·33** cm.
kg.: 16·5, 20·0, 21·0. Av.: **19·17** kg.

Once spawned: **40** *Ind.*

5-year-olds:

3.1+G+: **4** Ind. (3 ♂, 1 ♀). Av.: **63·75** (♂♂: 60·0) cm., **2·45** (♂♂: 2·17) kg.
cm.: 55, 60, 65, 75 (♀).
kg.: 2·0, 2·1, 2·4, 3·3 (♀).

6-year-olds:

2.1+G2: 1 ♂: 100 cm., 12·0 kg. — 1 ♀: 80 cm., 5·5 kg.

3.1+G1: **8** Ind. (2 ♂, 6 ♀). Av.: **78·25** (♀♀: 78·0) cm., **4·74** (♀♀: 4·77) kg.
cm.: 70, 73, 78 (♂), 80 (3), 80 (♂), 85.
kg.: 3·0, 3·3, 4·0 (♂), 4·3, 5·0, 5·3 (♂), 6·5 (2).

3.2+G+: 2 ♀: 85 and 90 cm., 6·5 and 8·0 kg.

7-year-olds:

3.1+G2: **11** Ind. (10 ♂, 1 ♀). Av.: **112·3** (♂♂: 113·67) cm., **12·55** (♂♂: 12·65) kg.
cm.: 96, 99 (2), 100, 100 (♀), 101, 103, 104 (2), 105, 112.
kg.: 10·0, 11·5, 11·5 (♀), 12·5 (2), 13·0 (3), 13·5 (2), 14·0.

3.2+G1: 3 ♀: cm.: 85·97 and 98. Av.: **93·33** cm.
kg.: 8·0, 10·0 (2). Av.: **9·33** kg.

3.3G+: **7** Ind. (5 ♂, 2 ♀). Av.: **102·29** (♂♂: 103·2) cm., **10·86** (♂♂: 11·40) kg.
cm.: 90 (♀), 95, 103 (2), 105, 110, 110 (♀).
kg.: 6·0 (♀), 9·5, 10·5, 11·5, 12·0, 13·0 (♀), 13·5.

8-year-olds:

4.2+G1: 1 ♀: 90 cm., 7·0 kg.

3.3G1: 2 ♀: 100 and 110 cm., 11·5 and 16·5 kg.

Twice spawned: **2** *Ind.*

8-year-olds:

3.2+G1G+: 1 ♂: 95 cm., 9·0 kg.

10-year-olds:

3.3G1G1: 1 ♀: 112 cm., 12·0 kg.

1943: **1812** Ind.

2.1+: 1 Ind. 45 cm., 1·0 kg.

3.1+: **106** Ind. Av.: **46·38** cm., **1·12** kg.
cm.: 35, 37, 38 (5), 40 (11), 41 (4), 42 (3), 43 (6), 45 (23), 46 (6), 47 (3), 48 (7), 49 (6), 50 (13), 51 (3), 52 (3), 54, 55 (4), 56 (2), 57 (2), 60, 65.
kg.: 0·5 (2), 0·6 (2), 0·7 (5), 0·8 (7), 0·9 (10), 1·0 (35), 1·1, 1·2 (14), 1·3 (5), 1·4 (4), 1·5 (14), 1·6, 1·7, 1·8 (2), 1·9, 2·0 (2).

4.1+: **14** Ind. Av.: **48·70** cm., **1·19** kg.
cm.: 37, 38, 42, 45 (2), 46 (2), 48, 49, 52 (2), 55, 58, 60.
kg.: 0·5, 0·7, 0·9 (2), 1·0 (4), 1·3 (2), 1·5, 1·6, 2·0 (2).

5.1+: 1 Ind.: 55 cm., 1·5 kg.

2.2+: **6** Ind. (4 ♂, 2 ♀). Av.: **67·67** (♂♂: 68·0) cm., **3·67** (♂♂: 3·88) kg.
cm.: 65 (2), 65 (♀), 69 (♀), 70, 72.
kg.: 3·0 (♀), 3·5 (2), 3·5 (♀), 4·0, 4·5.

3.2+: **109** Ind. (43 ♂, 51 ♀, 15 undeterm.). Av.: **67·21** (♂♂: 68·16, ♀♀: 67·63) cm., **3·24** (♂♂: 3·17, ♀♀: 3·36) kg.
cm.: 55 (2), 57, 58, 59 (2), 60 (18), 61, 63 (2), 64 (2), 65 (16), 66, 67 (5), 68 (2), 69 (9), 70 (23), 72 (6), 73 (2), 74 (2), 75 (12), 76, 78.
kg.: 2·0 (16), 2·5 (17), 3·0 (24), 3·5 (15), 4·0 (26), 4·5 (10), 5·0.

4.2+: **8** Ind. (all ♀): cm.: 60, 65 (4), 70 (2), 72. Av.: **66·5** cm.
kg.: 2·5, 3·0 (4), 3·5, 4·0, 4·5. Av.: **3·31** kg.

2.3+: **73** Ind. (22 ♂, 51 ♀). Av.: **85·84** (♂♂: 89·55, ♀♀: 84·24) cm., **7·26** (♂♂: 8·18, ♀♀: 6·86) kg.
cm.: 75 (2), 76, 78 (3), 79 (5), 80 (7), 82 (2), 83, 84 (4), 85 (12), 86 (4), 87, 88, 89 (10), 90 (8), 91 (3), 92 (4), 93 (2), 95, 98, 99.
kg.: 4·5 (2), 5·0 (8), 5·5 (2), 6·0 (9), 6·5 (3), 7·0 (9), 7·5 (7), 8·0 (17), 8·5 (6), 9·0 (5), 9·5 (3), 10·0, 10·5.

3.3: **1205** Ind. (259 ♂, 946 ♀). Av.: **84·71** (♂♂: 87·64, ♀♀: 83·9) cm., **6·94** (♂♂: 7·69, ♀♀: 6·73) kg.
cm.: 70 (2), 73 (3), 74 (10), 75 (85), 76 (25), 77 (19), 78 (36), 79 (56), 80 (150), 81 (15), 82 (52), 83 (31), 84 (57), 85 (215), 86 (37), 87 (45), 88 (35), 89 (65), 90 (104), 91 (9), 92 (29), 93 (5), 94 (6), 95 (60), 96 (4), 97 (4), 98 (10), 99 (15), 100 (16), 101 (3), 103, 105.
kg.: 4·0 (19), 4·5 (25), 5·0 (154), 5·5 (68), 6·0 (204), 6·5 (77), 7·0 (208), 7·5 (79), 8·0 (148), 8·5 (47), 9·0 (93), 9·5 (25), 10·0 (40), 10·5 (7), 11·0 (8), 11·5, 12·0 (2).

4.3: **53** Ind. (9 ♂, 44 ♀). Av.: **83·45** (♂♂: 85·56, ♀♀: 83·02) cm., **6·54** (♂♂: 7·22, ♀♀: 6·40) kg.
cm.: 72 (2), 75 (5), 76, 77, 78, 79 (3), 80 (5), 81, 82 (2), 83 (2), 84 (2), 85 (13), 86 (5), 88, 89, 90 (6), 95, 105.
kg.: 4·0 (4), 4·5 (4), 5·0 (4), 5·5 (5), 6·0 (9), 6·5 (3), 7·0 (5), 7·5 (7), 8·0 (7), 8·5, 9·0 (2), 10·0, 11·5.

2.4: **40** Ind. (21 ♂, 19 ♀). Av.: **102·88** (♂♂: 104·38, ♀♀: 101·21) cm., **11·84** (♂♂: 12·17, ♀♀: 11·47) kg.
cm.: 94, 95 (2), 98 (2), 99 (3), 100 (5), 101 (5), 102 (4), 103 (3), 105 (5), 106 (3), 109, 110 (4), 112 (2).
kg.: 8·0, 9·0, 10·0 (4), 10·5 (2), 11·0 (7), 11·5 (2), 12·0 (10), 12·5 (2), 13·0 (5), 14·0 (4), 14·5, 15·0.

3.4: **145** Ind. (68 ♂, 77 ♀). Av.: **102·52** (♂♂: 104·09, ♀♀: 101·14) cm., **11·67** (♂♂: 12·39, ♀♀: 11·03) kg.
cm.: 90, 91, 92 (2), 93, 95 (12), 96 (2), 98 (6), 99 (3), 100 (43), 101 (5), 102 (9), 103 (7), 104 (6), 105 (15), 106, 107 (2), 108, 109 (6), 110 (9), 111 (5), 112 (2), 113 (2), 115 (5), 118.
kg.: 8·5, 9·0 (16), 9·5 (3), 10·0 (23), 10·5 (8), 11·0 (19), 11·5 (10), 12·0 (21), 12·5 (3), 13·0 (15), 13·5 (3), 14·0 (6), 14·5 (2), 15·0 (5), 15·5 (6), 16·0 (2), 17·0, 17·5.

4.4: **6** Ind. (5 ♂, 1 ♀). Av.: **104·67** (♂♂: 105·8) cm., **12·67** (♂♂: 13·1) kg.
cm.: 95, 99 (♀), 105, 109, 110 (2).
kg.: 9·0, 10·5 (♀), 13·0, 13·5, 14·0, 16·0.

3.5: 1 ♂: 120 cm., 18·0 kg.

Once spawned: **41** *Ind.*

5-year-olds:

3.1+G+: 1 ♀: 67 cm., 3·0 kg.

6-year-olds:

3.1+G1: **6** Ind. (3 ♂, 3 ♀). Av.: **74·0** (♂♂: 75·67, ♀♀: 72·33) cm., **4·67** (♂♂: 5·33, ♀♀: 4·0) kg.
cm.: 70 (2 ♀), 75 (2 ♂), 77 (♂, ♀).
kg.: 3·0 (♀), 4·0 (♀), 5·0 (♀), 5·0 (♂), 5·5 (2 ♂).

2.3G+: 1 ♂: 85 cm., 7·0 kg.

3.2+G+: 2 ♂: 74 and 80 cm., 4·0 and 5·0 kg.

7-year-olds:

2.4G+: 1 ♀: 104 cm., 13·0 kg.

3.1+G2: 1 ♂: 90 cm., 10·5 kg. and 1 ♀: 80 cm., 6·0 kg.

3.2+G1: 1 ♂: 90 cm., 7·5 kg. and 6 ♀: 79, 82, 84, 92, 95 cm., 5·5, 6·0, 7·0, 8·0, 10·0, 11·5 kg. Av.: **87·5** cm., 8·0 kg.

2.3G1: 3 ♀: 100, 104 and 110 cm., 13·0, 13·5 and 16·0 kg.

3.3G+: 2 ♀: both 99 cm., 10·0 and 13·0 kg.

8-year-olds:

3.3G1: **15** Ind. (5 ♂, 9 ♀, 1 undeterm.). Av.: **102·6** (♂♂: 104·0, ♀♀: 101·78) cm., **12·33** (♂♂: 12·6, ♀♀: 12·11) kg.
cm.: 95, 100 (2), 101 (3), 102 (3), 103, 105 (3), 107, 110.
kg.: 10·0 (2), 11·0 (3), 11·5 (2), 12·0, 13·0, 14·0 (6).

3.4G+: 1 ♀: 110 cm., 13·0 kg.

Twice spawned: **3** *Ind.*

6-year-olds:

3.1+G+G+: 1 Ind.: 65 cm., 2·8 kg.

7-year-olds:

3.1+G1G+: 1 ♀: 90 cm., 7·5 kg.

9-year-olds:

2.3G1G1: 1 ♂: 115 cm., 17·0 kg.

1944: **3486** Ind.

2.1+: **17** Ind. Av.: **49·06** cm., **1·41** kg.
cm.: 35, 40, 45 (7), 49, 50, 55 (3), 60 (3).
kg.: 1·0 (7), 1·5 (6), 2·0 (4).

3.1+: **359** Ind. Av.: **50·23** cm., **1·29** kg.
cm.: 33, 35 (11), 36, 38 (6), 39 (2), 40 (13), 43, 45 (74), 46, 48 (18), 49 (11), 50 (85), 52, 53, 54, 55 (73), 56, 57 (2), 58 (14), 59 (2), 60 (39), 65.
kg.: 0·5 (23), 1·0 (181), 1·5 (77), 2·0 (77), 2·5.

4.1+: **21** Ind. Av.: **47·71** cm., **1·1** kg.
cm.: 35 (2), 38, 40, 45 (5), 48, 49, 50 (5), 54, 55 (2), 58, 60.
kg.: 0·5 (3), 1·0 (13), 1·5 (3), 2·0 (2).

2.2+: **60** Ind. (29 ♂, 16 ♀, 15 undeterm.). Av.: **67.82** (♂♂: 69·41, ♀♀: 67·69) cm., **3·08** (♂♂: 3·33, ♀♀: 3·06) kg.
cm.: 55, 58, 60 (9), 62, 63 (3), 65 (9), 67, 68, 69, 70 (15), 71 (2), 73 (7), 74 (2), 75 (7).
kg.: 1·5 (2), 2·0 (13), 2·5 (10), 3·0 (13), 3·5 (4), 4·0 (10), 4·5 (6), 5·0, 5·5.

3.2+: **1707** Ind. (530 ♂, 732 ♀, 445 undeterm.). Av.: **68·5** (♂♂: 70·27, ♀♀: 68·14) cm., **3·26** (♂♂: 3·55, ♀♀: 3·21) kg.
cm.: 55 (12), 56 (2), 57 (4), 58 (18), 59 (16), 60 (227), 61 (5), 62 (17), 63 (25), 64 (10), 65 (242), 66 (10), 67 (34), 68 (64), 69 (31), 70 (473), 71 (44), 72 (37), 73 (92), 74 (17), 75 (269), 76 (9), 77 (4), 78 (30), 79, 80 (13), 86.
kg.: 1·0, 1·5 (4), 2·0 (187), 2·5 (283), 3·0 (476), 3·5 (279), 4·0 (274), 4·5 (96), 5·0 (81), 5·5 (23), 6·0 (3).

4.2+: **43** Ind. (11 ♂, 20 ♀, 12 undeterm.). Av.: **71·95** (♂♂: 72·0, ♀♀: 71·8) cm., **3·88** (♂♂: 3·91, ♀♀: 3·98) kg.
cm.: 60 (2), 61, 64, 65 (2), 68 (2), 69 (2), 70 (10), 73 (4), 74 (2), 75 (11), 76, 78, 80 (2), 83 (2).
kg.: 2·5 (3), 3·0 (11), 3·5 (4), 4·0 (15), 4·5 (3), 5·0 (2), 5·5 (3), 6·0, 6·5.

2.3: **17** Ind. (5 ♂, 12 ♀). Av.: **84·12** (♂♂: 86·2, ♀♀: 83·25) cm., **6.68** (♂♂: 7·50, ♀♀: 6·33) kg.
cm.: 75, 80 (3), 83 (6), 85 (4), 87, 95 (2).
kg.: 5·0 (2), 5·5 (2), 6·0 (4), 6·5 (3), 7·0, 8·0 (3), 9·0 (2).

3.3: **452** Ind. (66 ♂, 346 ♀, 40 undeterm.). Av.: **84·53** (♂♂: 85·88, ♀♀: 84·32) cm., **6·75** (♂♂: 7·11, ♀♀: 6·71) kg.
cm.: 75 (21), 76 (4), 77 (3), 78 (16), 79 (3), 80 (40), 81 (3), 82 (19), 83 (48), 84 (18), 85 (168), 86 (15), 87 (13), 88 (6), 89 (25), 90 (19), 91, 92 (2), 93 (5), 95 (16), 96, 98 (2), 100 (4).
kg.: 4·0 (3), 4·5 (5), 5·0 (42), 5·5 (34), 6·0 (100), 6·5 (46), 7·0 (85), 7·5 (27), 8·0 (67), 8·5 (18), 9·0 (14), 9·5 (7), 10·0 (2), 10·5 (2).

4·3: **8** Ind. (1 ♂, 7 ♀). Av.: **86·38** (♀♀: 86·0) cm., **7·38** (♀♀: 7·29) kg.
cm.: 75, 83, 85, 87 (2), 89 (♂), 90, 95.
kg.: 5·5 (2), 7·0, 7·5, 8·0, 8·0 (♂), 8·5 9·0.

2·4: **102** Ind. (28 ♂, 71 ♀, 3 undeterm.). Av.: **101·1** (♂♂: 106·5, ♀♀: 99·2) cm., **11·07** (♂♂: 13·19, ♀♀: 10·3) kg.
cm.: 85 (3), 87, 88, 90, 91, 92, 93 (3), 94, 95 (19), 97, 98, 99, 100 (17), 101 (3), 102, 103 (7), 104 (6), 105 (9), 106 (4), 107, 108 (4), 109 (6), 110 (7), 114, 118 (2).
kg.: 7·0, 7·5 (2), 8·0 (8), 8·5, 9·0 (11), 9·5 (7), 10·0 (11), 10·5 (10), 11·0 (11), 11·5 (3), 12·0 (7), 12·5 (6), 13·0 (9), 13·5 (2), 14·0 (3), 14·5, 15·0 (6), 15·5, 17·0 (2).

3.4: **656** Ind. (176 ♂, 430 ♀, 50 undeterm.). Av.: **99·35** (♂♂: 104·06, ♀♀: 97·6) cm., **10·46** (♂♂: 12·0, ♀♀: 9·88) kg.
cm.: 84, 85 (17), 86 (7), 87 (6), 88 (2), 89 (9), 90 (25), 91 (3), 92 (9), 93 (14), 94 (8), 95 (138), 96 (12), 97 (5), 98 (18), 99 (11), 100 (138), 101 (15), 102 (11), 103 (26), 104 (29), 105 (33), 106 (32), 107 (10), 108 (9), 109 (20), 110 (34), 111 (2), 112 (3), 113 (2), 114 (2), 115 (4), 117.
kg.: 6·0, 6·5 (3), 7·0 (4), 7·5 (14), 8·0 (44), 8·5 (40),

9·0 (106), 9·5 (55), 10·0 (101), 10·5 (48), 11·0 (68), 11·5 (26), 12·0 (37), 12·5 (15), 13·0 (25), 13·5 (16), 14·0 (19), 14·5 (6), 15·0 (10), 15·5 (3), 16·0 (8), 16·5, 17·0 (4), 17·5, 18·5.

4.4: **8** Ind. (3 ♂, 5 ♀). Av.: **99·0** (♂♂: 107·0, ♀♀: 94·2) cm., **10·94** (♂♂: 13·33, ♀♀: 9·5) kg.
cm.: 87, 89, 95, 100 (2), 103 (♂), 109 (2 ♂).
kg.: 6·5, 8·5, 9·0, 10·5, 12·0 (♂), 13·0, 13·0 (♂), 15·0 (♂).

Once spawned: **36** *Ind.*

5-year-olds:

3.1+G+: **9** Ind. (3 ♂, 2 ♀, 4 undeterm.). Av.: **60·33** (♂♂: 64·67, ♀♀: 57·0) cm., **2·17** (♂♂: 2·33, ♀♀: 2·0) kg.
cm.: 52, 55, 60 (4), 62, 64, 70.
kg.: 1·5, 2·0 (5), 2·5 (2), 3·0.

6-year-olds:

3.1+G1: **3** Ind. Av.: **71** cm., **3·5** kg.
cm.: 65, 68 (♂), 82 (♀).
kg.: 3·0, 3·0 (♂), 4·5 (♀).

3.2+G+: **3** Ind. Av.: **82·33** cm., **6·5** kg.
cm.: 79 (♀), 83 (♂),85 (♀).
kg.: 5·0 (♀), 6·0 (♂), 8·5 (♀).

7-year-olds:

3.2+G1: **4** Ind. (3 ♂, 1 ♀). Av.: **86·25** cm., **7·38** kg.
cm.: 83 (♀), 85 (2), 92.
kg.: 5·5 (♀), 7·0, 8·0, 9·0.

2.3G1: 1 ♀: 112 cm., 15·5 kg.

3.3G+: **7** Ind. (3 ♂, 4 ♀). Av.: **94·0** (♂♂: 91·67, ♀♀: 95·75) cm., **8·64** (♂♂: 8·0, ♀♀: 9·13) kg.
cm.: 83, 85, 95 (2), 97, 100, 103.
kg.: 6·0 (2), 9·0 (3), 10·0, 11·5.

8-year-olds:

3.3G1: **8** Ind. (2 ♂, 6 ♀). Av.: **103·63** (♂♂: 100·5, ♀♀: 104·67) cm., **11·31** (♂♂: 10·5, ♀♀: 11·58) kg.
cm.: 100 (3), 101, 105 (2), 109 (2).
kg.: 10·0 (3), 11·0, 11·5, 12·0 (2), 14·0.

9-year-olds:

3.4G1: 1 ♀: 115 cm., 14·0 kg.

2. Kemi: Valkeakari (in the Sea).

1936: **1009** Ind.

2.1+: **12** Ind. Av.: **51·92** cm., **1·54** kg.
cm.: 43, 46, 49, 50 (2), 51, 53, 54, 55, 56, 58.
kg.: 0·7, 1·2 (2), 1·3, 1·4, 1·5 (2), 1·6 (2), 1·8, 2·3, 2·4.

3.1+: **59** Ind. Av.: **51·66** cm., **1·45** kg.
cm.: 41, 44, 45 (4), 46, 47 (2), 48 (5), 49 (9), 50 (7), 51(3), 52 (4), 53 (3), 54 (2), 55 (5), 56 (3), 58 (3), 59 (2), 60, 62, 63, 64.
kg.: 0·7, 0·8 (3), 0·9 (2), 1·0 (10), 1·1 (2), 1·2 (5). 1·3 (5), 1·4, 1·5 (3), 1·6 (3), 1·7, 1·8, 1·9, 2·0 (7), 2·5 (2), 2·8, 3·2.

4.1+: **10** Ind. Av.: **54.6** cm., **1.81** kg.
cm.: 45, 50, 52, 53 (2), 56 (2), 60 (2), 61.
kg.: 1·2, 1·5 (3), 1·6 (2), 1·9, 2·0, 2·6, 2·7.

2.2+: **11** Ind. (5 ♂, 6 ♀). Av.: **78·91** (♂♂: 81·4, ♀♀: 76·83) cm., **5·95** (♂♂: 6·26, ♀♀: 5·68) kg.
cm.: 74, 75 (2), 78 (2), 79, 80 (2), 81, 82, 86.
kg.: 4·1, 5·0, 5·5 (3), 6·0, 6·5 (4), 7·8.

3.2+: **220** Ind. (38 ♂, 182 ♀). Av.: **79·76** (♂♂: 80·18, ♀♀: 79·67) cm., **6 0** (♂♂: 6·09, 5·86) kg.
cm.: 61, 62, 64, 65, 67, 68, 69, 70, 71, 72 (4), 73 (4), 74 (15), 75 (7), 76 (11), 77 (10), 78 (11), 79 (20), 80 (32), 81 (23), 82 (16), 83 (8), 84 (18), 85 (13), 86 (6), 87 (4), 88, 89, 90 (6), 94.
kg.: 3·0 (7), 3·5 (7), 4·0 (8), 4·5 (16), 5·0 (40), 5·5 (25), 6·0 (30), 6·5 (21), 7·0 (29), 7·5 (19), 8·0 (13), 8·5 (3), 9·0 (2).

4.2+: **44** Ind. (3 ♂, 41 ♀). Av.: **79·93** (♀♀: 80·07) cm., **5·97** (♀♀: 6·01) kg.
cm.: 67, 70 (♂), 71 (3), 72, 74 (2), 75, 76, 78 (4), 79 (5), 80 (5), 80 (♂), 81 (2), 82, 83 (2), 84 (3), 84 (♂), 85 (6), 86, 87, 90 (2).
kg.: 3·0 (♂), 3·5 (2), 4·0 (3), 4·5, 5·0 (7), 5·5 (4), 6·0 (9), 6·5 (2), 7·0 (6), 7·5 (4), 8·0 (4), 8·5.

2.3: **61** Ind. (11 ♂, 50 ♀). Av.: **98·52** (♂♂: 103·91, ♀♀: 97·34) cm., **11·64** (♂♂: 13·82, ♀♀: 11·17) kg.
cm.: 82, 85, 86, 90 (3), 92, 93 (2), 94 (3), 95 (4), 96 (3), 97 (3), 98 (5), 99 (6), 100 (5), 101 (4), 102 (8), 104 (4), 105 (4), 107, 110, 111.
kg.: 7·0, 7·5 (2), 8·0 (2), 8·5, 9·0 (2), 10·0 (6), 10·5 (8), 11·0 (5), 11·5 (4), 12·0 (8), 12·5 (5), 13·0 (6), 13·5, 14·0 (4), 14·5, 15·0, 15·5 (2), 16·0, 17·5.

3.3: **469** Ind. (96 ♂, 373 ♀). Av.: **98·66** (♂♂: 101·86, ♀♀: 97·84) cm., **11·5** (♂♂: 12·78, ♀♀: 11·17) kg.
cm.: 78, 84, 85 (2), 86 (3), 87, 88, 89 (5), 90 (17), 91 (13), 92 (13), 93 (10), 94 (29), 95 (29), 96 (33), 97 (24), 98 (40), 99 (35), 100 (56), 101 (25), 102 (21), 103 (23), 104 (27), 105 (20), 106 (17), 107 (3), 108 (4), 109 (6), 110 (7), 111, 113, 114.
kg.: 7·0 (2), 7·5 (8), 8·0 (11), 8·5 (13), 9·0 (32), 9·5 (24), 10·0 (50), 10·5 (39), 11·0 (41), 11·5 (25), 12·0 (61), 12·5 (40), 13·0 (39), 13·5 (16), 14·0 (21), 14·5 (22), 15·0 (10), 15·5 (8), 16·0 (4), 16·5, 17·0, 18·0.

4.3: **46** Ind. (16 ♂, 30 ♀). Av.: **100·28** (♂♂: 102·69, ♀♀: 99·0) cm., **11·98** (♂♂: 13·29, ♀♀: 11·28) kg.
cm.: 88, 90, 91 (2), 92, 93, 94 (2), 96, 97, 98 (2), 99 (4), 100 (7), 101 (2), 103 (2), 104 (6), 105 (2), 106 (4), 110 (2), 115.
kg.: 8·5 (2), 9·0 (4), 9·5, 10·0 (4), 11·0 (5), 11·5, 12·0 (5), 12·5 (3), 13·0 (8), 13·5 (5), 14·0 (5), 14·5 (3).

2.4: **8** Ind. (6 ♂, 2 ♀). Av.: **112·25** (♂♂: 112·67) cm., **16·91** (♂♂: 17·8) kg.
cm.: 103, 109 (♀), 112, 113 (♀), 114, 115 (2), 117.
kg.: 13·5 (♀), 15·2 (♀), 15·5, 16·0, 17·0, 19·0, 19·5 (2).

3.4: **60** Ind. (46 ♂, 14 ♀). Av.: **112·42** (♂♂: 113·26, ♀♀: 109·64) cm., **17·37** (♂♂: 17·75, ♀♀: 16·21) kg.
cm.: 104 (2), 105, 106 (2), 107 (2), 108 (4), 109 (5), 110 (12), 111 (3), 112, 113 (3), 114 (2), 115 (5), 116 (5), 117 (3), 118 (4), 119 (2), 120 (3), 121.
kg.: 14·0, 14·5 (2), 15·0 (6), 15·5 (3), 16·0 (8),

16·5 (5), 17·0 (6), 17·5 (7), 18·0 (7), 18·5 (2), 19·0 (2), 19·5, 20·0 (3), 20·5 (3), 21·5 (3), 22·0.

4.4: **8** Ind. (6 ♂, 2 ♀). Av.: **112·25** (♂♂: 113·17) cm., **16·03** (♂♂: 15·5) kg.
cm.: 109 (♀), 110 (♀), 110 (3), 113, 114, 122.
kg.: 12·5, 13·5 (2), 14·5, 17·2 (♀), 18·0, 18·0 (♀), 21·0.

2.5: 1 ♂: 120 cm., 18·0 kg.

Once spawned: **81** *Ind.*

5-year-olds:
3.1+G+: **5** ♂: cm.: 51, 58 (2), 60, 65. Av.: **58·4** cm.
kg.: 1·2, 1·8, 2·2, 2·3, 2·5. Av.: **2·0** kg.

6-year-olds:
2.1+G2: 1 ♀: 106 cm., 15·0 kg.
3.1+G1: **4** Ind. (3 ♂, 1 ♀). Av.: **76·75** (♂♂: 80·0) cm., **5·58** (♂♂: 6·40) kg.
cm.: 67 (♀), 78, 80, 82.
kg.: 3·1 (♀), 6·0, 6·2, 7·0.

7-year-olds:
3.1+G2: **8** Ind. (7 ♂, 1 ♀). Av.: **101·0** (♂♂: 102·43) cm., **12·83** (♂♂: 13·44) kg.
cm.: 91 (♀), 95, 101, 102, 103, 105 (2), 106.
kg.: 8·5 (♀), 11·3, 12·5, 13·0, 14·0, 14·3, 14·5 (2).
4.1+G1: 1 ♂: 77 cm., 5·0 kg.

3.2+G1: **9** ♀: cm.: 86, 90, 92, 93, 94, 98, 101, 104, 110. Av.: **96·44** cm.
kg.: 7·5, 8·5, 9·0 (2), 9·3, 9·5 (2), 11·1. Av.: **9·49** kg.
4.2+G+: 1 ♀: 82 cm., 7·8 kg.

2.3G1: 1 ♂: 109 cm., 18·0 kg.
3.3G+: 2 ♀: 100 and 106 cm., 10·7 and 12·5 kg.
3.3G: 2 ♀: 95 and 104 cm., 5·0 and 7·0 kg.

8-year-olds:
4.1+G2: 2 ♂: both 96 cm., 11·0 and 12·0 kg.

4.2+G1: 2 ♀: 85 and 90 cm., 7·5 and 8·5 kg.

3.3G1: **46** Ind. (3 ♂, 43 ♀). Av.: **104·26** (♂♂: 98·67, ♀♀: 104·65) cm., **13·28** (♂♂: 11·0, ♀♀: 13·44) kg.
cm.: 91, 94, 95 (2), 96, 99 (2), 100 (5), 101 (3), 102 (2), 103, 104 (4), 105 (6), 106 (3), 107, 108 (3), 109 (2), 110 (6), 114 (2), 116.
kg.: 8·0, 9·5, 10·0 (2), 10·5, 11·0 (3), 11·5 (3), 12·0 (2), 12·5 (2), 13·0 (8), 13·5 (5), 14·0 (2), 14·5 (3), 15·0 (8), 15·5, 16·0, 16·5 (2), 18·0.

9-year-olds:
4.2+G2: 1 ♂: 110 cm., 16·0 kg.

4.3G1: 1 ♂: 96 cm., 11·0 kg. — 1 ♀: 115 cm., 20·0 kg.

3.4G1: **4** Ind. (3 ♂, 1 ♀). Av.: **116·25** (♂♂: 116·07) cm., **18·08** (♂♂: 18·27) kg.
cm.: 114, 115, 115 (♀), 121.
kg.: 17·5 (♀), 17·8, 18·0, 19·0.

Twice spawned: **5** *Ind.*

9-year-olds:
3·2+G1G1: 1 ♀: 96 cm., 8·5 kg.

10-year-olds:
3.3G1G1: 1 ♂, 2 ♀: all 114 cm.,
kg. 13·5 (♀), 15·3 (♂) and 17·0 (♀).

11-year-olds:
4.3G1G1: 1 ♀, 112 cm., 18·4 kg.

Three times spawned: **1** *Ind.*

11-year-olds:
4.1+G1G1G1: 1 ♂: 120 cm., 19·6 kg.

1937: **694** Ind.

2.1+: **31** Ind. Av.: **55·61** cm., **2·02** kg.
cm.: 49, 50, 51, 52 (2), 53, 54 (3), 55 (7), 56 (5), 57 (2), 58 (2), 59 (2), 60 (3), 62.
kg.: 1·3, 1·5 (3), 1·6, 1·7 (2), 1·8 (4), 2·0 (10), 2·1, 2·2, 2·5 (7), 2·8.

3.1+: **57** Ind. Av.: **56·0** cm., **2·02** kg.
cm.: 50 (2), 51 (2), 52 (6), 53 (3), 54 (7), 55 (5), 56 (10), 57 (4), 58 (5), 59 (5), 60 (2), 61 (2), 62 (2), 63, 64.
kg.: 1·3 (2), 1·5 (9), 1·6 (3), 1·8 (3), 1·9 (2), 2·0 (17), 2·1 (5), 2·2 (4), 2·4, 2·5 (7), 2·7, 2·8, 3·0, 3·1.

4.1+: **7** Ind. Av.: **56·86** cm., **2·24** kg.
cm.: 48, 53, 55, 59, 60, 61, 62.
kg.: 1·0, 1·7 (2), 2·5, 2·7, 3·0, 3·1.

2.2+: **9** Ind. (6 ♂, 3 ♀). Av.: **80·67** (♂♂: 82·0, ♀♀: 78·0) cm., **6·52** (♂♂: 6·83, ♀♀: 5·90) kg.
cm.: 75, 77 (2), 79, 80, 81 (2), 86, 90.
kg.: 5·0 (2), 5·9, 6·1, 6·2, 6·5 (2), 8·5, 9·0.

3.2+: **37** Ind. (4 ♂, 33 ♀). Av.: **77·89** (♂♂: 79·5, ♀♀: 77·7) cm., **5·65** (♂♂: 5·73, ♀♀: 5·64) kg.
cm.: 68, 71, 72 (2), 73, 74 (3), 75 (6), 76 (3), 77 (2), 78, 79 (4), 80 (3), 81, 82 (3), 83 (2), 85 (2), 87, 88.
kg.: 3·8, 4·0 (5), 4·5 (4), 5·0 (7), 5·5 (3), 6·0 (5), 6·5 (3), 7·0 (5), 7·5 (2), 8·0 (2).

4.2+: **24** Ind. (5 ♂, 19 ♀). Av.: **79·46** (♂♂: 84·4, ♀♀: 78·16) cm., **5·91** (♂♂: 7·78, ♀♀: 5·42) kg.
cm.: 71, 72, 73 (2), 75 (2), 76, 77 (2), 78 (4), 79, 80 (2), 82, 84 (2), 85, 87, 88 (2), 89.
kg.: 3·8, 4·0 (3), 4·5 (2), 5·0 (5), 5·5 (3), 6·0 (2), 6·5, 7·0 (2), 8·0 (2), 8·1, 9·0, 10·0.

2.3: **10** Ind. (5 ♂, 5 ♀). Av.: **101·5** (♂♂: 102·2, ♀♀: 100·8) cm., **13·26** (♂♂: 13·32, ♀♀: 13·2) kg.
cm.: 95, 96, 99, 102 (3), 103, 104, 105, 107.
kg.: 11·0, 12·0, 12·5, 13·0 (2), 13·5, 14·0 (2), 14·5, 15·0.

3.3: **303** Ind. (49 ♂, 254 ♀). Av.: **97·87** (♂♂: 102·22, ♀♀: 97·03) cm., **11·56** (♂♂: 13·04, ♀♀: 11·27) kg.
cm.: 80, 81, 82, 83, 85, 86, 88 (2), 89 (4), 90 (12), 91 (4), 92 (6), 93 (9), 94 (20), 95 (31), 96 (27), 97 (19), 98 (24), 99 (23), 100 (25), 101 (20), 102 (17), 103 (17), 104 (8), 105 (15), 106 (9), 107 (3), 108 (2).
kg.: 7·0, 7·5, 8·0 (12), 8·5 (8), 9·0 (24), 9·5 (16), 10·0 (29), 10·5 (13), 11·0 (33), 11·5 (15), 12·0

(29), 12·5 (19), 13·0 (52), 13·5 (14), 14·0 (16), 14·5 (6), 15·0 (7), 15·5 (4), 16·0 (2), 16·5 (2).

4.3: **67** Ind. (11 ♂, 56 ♀). Av.: **97·94** (♂♂: 102·09, ♀♀: 97·13) cm., **11·31** (♂♂: 12·45, ♀♀: 11·09) kg.
cm.: 85, 87, 88, 90 (2), 92 (4), 93, 94 (3), 95 (12), 96 (4), 97 (3), 98 (2), 99 (4), 100 (9), 101 (5), 102 (6), 104, 105 (5), 106, 108, 112.
kg.: 8·0 (4), 8·5, 9·0 (5), 9·5 (5), 10·0 (6), 10·5 (5), 11·0 (8), 11·5 (5), 12·0 (8), 12·5 (6), 13·0 (4), 13·5 (2), 14·0 (4), 15·0 (3), 16·0.

5.3: 2 ♂: 105 and 106 cm., 14·3 and 14·5 kg.

3.4: **23** Ind. (20 ♂, 3 ♀). Av.: **111·22** (♂♂: 112·45, ♀♀: 103·0) cm., **16·85** (♂♂: 17·26, ♀♀: 14·13) kg.
cm.: 90, 109, 110 (10), 111 (2), 113, 114 (2), 115 (3), 116 (2), 119.
kg.: 10·0, 13·5, 15·0 (3), 15·5 (3), 16·0 (2), 17·0 (3), 17·5 (2), 18·0, 18·5, 19·0 (3), 20·0, 20·5.

4.4: **9** Ind. (8 ♂, 1 ♀). Av.: **111·11** (♂♂: 111·38) cm., **16·76** (♂♂: 16·98) kg.
cm.: 105, 108, 109, 109 (♀), 111, 114 (2), 115 (2).
kg.: 15·0 (♀), 15·0 (2), 16·0 (2), 17·0, 18·5 (2), 20·0.

5.4: 2 ♂: 112 and 115 cm., 20·0 and 22·0 kg.

3.5: 2 ♂: 115 and 122 cm., 19·5 and 20·0 kg.

4.5: 2 ♂: 120 and 121 cm., 18·0 and 22·0 kg.

Once spawned: **100** *Ind.*

6-year-olds:

3.1+G1: **5** Ind. (2 ♂, 3 ♀). Av.: **86·2** (♀♀: 86·0) cm., **8·02** (♀♀: 8·37) kg.
cm.: 85 (♂), 86 (3), 88 (♂).
kg.: 6·0 (♂), 8·0, 8·5 (2), 9·0 (♂).

2.3G+: 1 ♀: 96 cm., 11·1 kg.

7-year-olds:

3.1+G2: **6** Ind. (2 ♂, 4 ♀). Av.: **98·5** (♀♀: 97·75) cm., **12·27** (♀♀: 11·4) kg.
cm.: 90 (♂), 91, 95, 101, 104, 110 (♂).
kg.: 9·0, 11·0, 12·2, 13·0 (♂), 13·4, 15·0 (♂).

4.1+G1: 2 ♀: 90 and 96 cm., 9·2 and 10·0 kg.

3.2+G1: **10** Ind. (1 ♂, 9 ♀). Av.: **97·5** (♀♀: 97·22) cm., **10·57** (♀♀: 10·63) kg.
cm.: 85, 93, 95, 96, 97, 98, 100, 100 (♂), 103, 108.
kg.: 7·5, 8·0, 10·0, 10·0 (♂), 10·2, 11·0, 12·0 (2), 12·5 (2).

3.3G+: **13** Ind. (1 ♂, 12 ♀). Av.: **93·54** (♀♀: 93·08) cm., **11·78** (♀♀: 11·85) kg.
cm.: 90, 96, 97, 99 (2), 99 (♂), 102, 103 (2), 104, 106 (2), 111.
kg.: 9·0, 10·0 (2), 10·5, 11·0 (♂), 12·0 (3), 12·1, 13·0, 13·5, 14·0 (2).

3.3G: 2 ♀: 100 and 106 cm., 8·0 and 10·0 kg.

8-year-olds:

4.1+G2: 2 ♀: 92 and 95 cm., 10·1 and 10·5 kg.

4.2+G1: **6** ♀: cm.: 90 (2), 93, 94, 98, 103. Av.: **94·67** cm.
kg.: 8·0, 9·2, 9·4, 11·0, 12·0, 13·5. Av.: **10·52** kg.

3.3G1: **41** Ind. (3 ♂, 38 ♀). Av.: **106·32** (♂♂: 108·33, ♀♀: 106·16) cm., **14·26** (♂♂: 12·13, ♀♀: 14·11) kg.
cm.: 97, 99 (2), 99 (♂), 101 (3), 102 (2), 103 (2), 104 (3), 105 (3), 106 (3), 107 (3), 108 (2), 109 (4), 110 (6), 111 (2), 111 (♂), 113 (2), 115 (♂).
kg.: 9·0, 9·5, 11·5 (2), 12·0 (4), 12·5 (2), 13·0 (3), 13·5, 14·0 (4), 14·0 (♂), 14·5, 15·0 (8), 15·5 (2), 16·0 (6), 16·0 (♂), 17·0 (2), 18·0, 18·5 (♂).

4.3G+: 2 ♂: 96 and 105 cm., 9·0 and 15·9 kg.

4.3G: 1 ♀: 107 cm., 8·5 kg.

9-year-olds:

5.1+G2: 1 ♂: 110 cm., 17·5 kg.

4.3G1: **10** ♀: cm.: 100, 101, 104 (2), 105, 106 (2), 108, 110, 111. Av.: **105·5** cm.
kg.: 11·2, 12·0, 12·3, 13·0, 14·0, 15·0, 16·0 (3), 17·0. Av.: **14·25** kg.

3.4G1: 1 ♂: 115 cm., 20·0 kg.

Twice spawned: **6** *Ind.*

10-year-olds:

4.2+G1G1: 1 ♀: 108 cm., 14·3 kg.

3.3G1G1: 4 ♀: cm.: 104, 110 (2), 115. Av.: **109·75**.
kg.: 10·5, 13·2, 15·5, 18·0. Av.: **14·3** kg.

11-year-olds:

4.2+G2G1: 1 ♂: 118 cm., 20·5 kg.

1938: **571** Ind.

2.1+: **16** Ind. Av.: **55·69** cm., **1·69** kg.
cm.: 49, 50, 51 (2), 54, 55 (4), 56, 57, 59 (2), 60 (2), 65.
kg.: 1·0 (3), 1·5 (3), 1·6, 1·7, 1·8, 2·0 (6), 2·5.

3.1+: **150** Ind. Av.: **57·41** cm., **1·97** kg.
cm.: 47, 49 (4), 50 (10), 51 (2), 52 (3), 53 (6), 54 (4), 55 (16), 56 (14), 57 (10), 58 (8), 59 (23), 60 (21), 61 (9), 62 (5), 63 (4), 64 (5), 65, 66 (3), 68.
kg.: 0·9 (2), 1·0 (9), 1·5 (38), 2·0 (65), 2·5 (26), 3·0 (8), 3·5 (2).

4.1+: **4** Ind.: cm.: 51, 54, 58, 60. Av.: **55·75** cm.
kg.: 1·5 (2), 2·0 (2). Av.: **1·75** kg.

2.2+: **39** Ind. (5 ♂, 34 ♀). Av.: **81·79** (♂♂: 83·20, ♀♀: 81·59) cm., **6·56** (♂♂: 7·24, ♀♀: 6·46) kg.
cm.: 71, 73, 74, 75, 76 (♂), 77 (2), 78, 79, 80 (7), 81, 83 (5), 83 (♂), 84 (3), 84 (♂), 85 (3), 85 (♂), 86 (4), 87 (2), 88 (♂), 89.
kg.: 4·0, 4·5 (2), 5·0 (2), 5·5 (5), 6·0 (5), 6·5 (8), 7·0 (5), 7·5 (4), 8·0 (4), 8·5 (2), 9·0.

3.2+: **108** Ind. (15 ♂, 93 ♀). Av.: **82·24** (♂♂: 83.93, ♀♀: 81·97) cm., **6·50** (♂♂: 6·97, ♀♀: 6·43) kg.
cm.: 69, 72, 73, 75 (6), 76 (5), 78 (7), 79 (9), 80 (10), 81 (6), 82 (4), 83 (7), 84 (11), 85 (17), 86 (8), 87 (4), 88 (4), 89 (4), 90, 91, 92.
kg.: 4·0 (3), 4·5 (5), 5·0 (15), 5·5 (8), 6·0 (12), 6·5 (16), 7·0 (17), 7·5 (14), 8·0 (12), 8·5 (2), 9·0 (4).

4.2+: **9** ♀: cm.: 78, 80, 81, 84, 85 (3), 89, 94. Av.: **84·56** cm.
kg.: 5·2, 6·0 (3), 7·0, 7·5 (2), 8·0, 9·5. Av.: **6.97** kg.

2.3: **26** Ind. (5 ♂, 21 ♀). Av.: **97·04** (♂♂: 100·8, ♀♀: 96·14) cm., **10·99** (♂♂: 11·9, ♀♀: 10·78) kg.

cm.: 87, 90 (2), 91, 93 (2), 94, 95 (3), 97 (2), 98 (6), 99, 100, 101 (2), 102, 104, 105, 106.
kg.: 8·8, 9·0 (2), 9·5, 10·0 (4), 10·5 (4), 11·0 (4), 11·8, 12·0 (4), 12·5 (2), 12·7, 13·0 (2).

3.3: **112** Ind. (23 ♂, 89 ♀). Av.: **98·29** (♂♂: 101·70, ♀♀: 97·42) cm., **11·60** (♂♂: 12·44, ♀♀: 11·39) kg.
cm.: 85, 88, 89, 90 (2), 91 (3), 92 (2), 93 (6), 94 (5), 95 (12), 96 (7), 97 (11), 98 (7), 99 (12), 100 (11), 101 (5), 102 (2), 103 (8), 104, 105 (8), 106 (3), 107, 108 (2), 111.
kg.: 7·0, 8·0 (2), 8·5, 9·0 (5), 9·5 (3), 10·0 (17), 10·5 (11), 11·0 (13), 11·5 (10), 12·0 (10), 12·5 (2), 13·0 (16), 13·5 (9), 14·0 (6), 14·5 (2), 15·0 (2), 16·5, 17·0.

4.3: **19** Ind. (2 ♂, 17 ♀). Av.: **98·11** (♀♀: 97·06) cm., **11·47** (♀♀: 11·12) kg.
cm.: 85, 90, 94, 95 (2), 96 (3), 97, 98, 99 (2), 100, 101 (2), 104 (2), 107 (2 ♂).
kg.: 8·0, 9·0, 10·0 (2), 10·5 (3), 11·0 (2), 11·5 (2), 12·0 (3), 13·0 (3), 14·0 (♂), 15·0 (♂).

2.4: 2 ♂: 108 and 112 cm., both 15·0 kg.

3.4: **27** Ind. (16 ♂, 11 ♀). Av.: **111·70** (♂♂: 113·44, ♀♀: 109·18) cm., **15·96** (♂♂: 16·84, ♀♀: 14·67) kg.
cm.: 104, 106, 107, 108 (4), 109, 110 (3), 111 (4), 114 (2), 115 (7), 116 (2), 119.
kg.: 11·5, 12·0, 13·0 (2), 13·4, 14·0 (2), 14·5, 15·0 (2), 15·5, 16·0 (5), 17·0 (3), 17·5 (2), 18·0 (2), 19·0 (2), 19·5, 21·0.

4.4: 2 ♀: 104 and 106 cm., both 14·0 kg. — 1 ♂: 116 cm., 19·5 kg.

3.5: **7** ♂: cm. 119, 120 (2), 121, 124, 126, 130. Av.: **122·86** cm.
kg.: 18·0, 18·5, 20·0, 21·0, 21·5, 22·0, 22·5. Av.: **20·5** kg.

4.5: 1 ♂: 120 cm., 20·5 kg.

Once spawned: **44** *Ind.*

5-year-olds:
2.1+G1: 1 ♀: 83 cm., 6·5 kg.

6-year-olds:
3.1+G1: 2 ♀: 82 and 88 cm., 6·5 and 8·0 kg.

7-year-olds:
3.1+G2: 2 ♂: 103 and 108 cm., 13·0 and 15·0 kg.

3.2+G1: **8** ♀: cm.: 90 (2), 93, 94 (2), 95, 99, 100. Av.: **94·38** cm.
kg.: 8·5 (2), 9·5, 9·8, 10·0 (2), 12·5, 14·0. Av.: **10·35** kg.

3.3G+: 1 ♂: 100 cm., 12·5 kg.

8-year-olds:
4.1+G2: 1 ♀: 92 cm., 9·0 kg.

4.2+G1: 1 ♀: 95 cm., 10·0 kg.

3.3G1: **24** Ind. (6 ♂, 18 ♀). Av.: **106·88** (♂♂: 106·0, ♀♀: 107·17) cm., **13·58** (♂♂: 13·08, ♀♀: 13·74) kg.
cm.: 99, 100, 101 (3), 102, 104, 105 (3), 107, 108 (2), 109 (3), 110 (3), 111, 112 (3), 113, 114.
kg.: 9·0, 11·5, 12·0 (2), 12·5, 13·0 (6), 13·5 (4), 14·0 (2), 14·5, 15·0, 15·5 (2), 16·0 (2), 16·3.

9-year-olds:
4.3G1: 1 ♀: 101 cm., 13·0 kg.

3.4G1: 3 ♂: cm.: 111, 112, 115. Av.: **112·67**.
kg.: 14·0, 15·0, 20·0. Av.: **16·33**.

Twice spawned: **4** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♀: 102 cm., 15·0 kg.

10-year-olds:
3.3G1G1: 2 ♀: 107 and 110 cm., 13·0 and 14·0 kg. — 1 ♂: 115 cm., 17·0 kg.

1939: **1209** Ind.

2.1+: **110** Ind. Av.: **54·14** cm., **1·71** kg.
cm.: 44, 45 (3), 46, 47, 48 (2), 49 (4), 50 (7), 51 (8), 52 (11), 53 (10), 54 (7), 55 (13), 56 (13), 57 (7), 58 (6), 59 (6), 60 (6), 61, 62, 63 (2).
kg.: 0·8 (2), 1·0 (9), 1·1 (3), 1·2 (3), 1·3 (5), 1·4 (7), 1·5 (21), 1·6 (4), 1·7, 1·8 (9), 1·9 (3), 2·0 (20), 2·1, 2·2 (3), 2·4, 2·5 (4), 2·6, 2·8 (4), 3·0 (3).

3.1+: **409** Ind. Av.: **54·55** cm., **1·74** kg.
cm.: 40, 43 (2), 44, 45 (3), 46, 47 (8), 48 (12), 49 (15), 50 (19), 51 (29), 52 (32), 53 (23), 54 (45), 55 (52), 56 (34), 57 (40), 58 (29), 59 (21), 60 (21), 61 (8), 62 (6), 63 (4), 64 (3).
kg.: 0·5 (2), 0·6, 0·7, 0·8 (4), 0·9 (3), 1·0 (23), 1·1 (13), 1·2 (16), 1·3 (10), 1·4 (17), 1·5 (90), 1·6 (28), 1·7 (14), 1·8 (19), 1·9 (18), 2·0 (68), 2·1 (11), 2·2 (14), 2·3 (3), 2·4 (5), 2·5 (27), 2·6 (2), 2·7 (2), 2·8 (6), 2·9 (4), 3·0 (7), 3·1.

4.1+: **21** Ind. Av.: **53·14** cm., **1·60** kg.
cm.: 46, 49, 50, 51 (2), 52 (5), 53, 54 (4), 55, 56, 57 (3), 58.
kg.: 1·0, 1·2 (2), 1·4 (4), 1·5 (5), 1·6, 1·7, 1·8 (2), 2·0 (3), 2·1, 2·2.

2.2+: **17** Ind. (1 ♂, 16 ♀). Av.: **81·06** (♀♀: 80·38) cm., **6·52** (♀♀: 6·31) kg.
cm.: 73, 76, 77, 78 (3), 79 (2), 80, 82 (2), 83, 84 (2), 85, 88, 92 (♂).
kg.: 5·0 (3), 5·5, 6·0 (3), 6·2 (2), 6·5 (2), 7·0 (2), 7·5 (2), 8·0, 10·0 (♂).

3.2+: **392** Ind. (24 ♂, 368 ♀). Av.: **81·68** (♂♂: 86·67, ♀♀: 81·36) cm., **6·55** (♂♂: 7·87, ♀♀: 6·47) kg.
cm.: 63, 65, 70 (8), 71 (2), 72 (12), 73 (6), 74 (2), 75 (20), 76 (13), 77 (13), 78 (20), 79 (31), 80 (34), 81 (18), 82 (34), 83 (17), 84 (31), 85 (39), 86 (22), 87 (19), 88 (9), 89 (18), 90 (11), 91 (4), 92 (2), 93 (2), 94 (2), 95.
kg.: 3·5 (4), 4·0 (12), 4·5 (12), 5·0 (49), 5·5 (28), 6·0 (74), 6·5 (33), 7·0 (77), 7·5 (22), 8·0 (35), 8·5 (19), 9·0 (18), 9·5 (5), 10·0 (4).

4.2+: **11** Ind. (1 ♂, 10 ♀). Av.: **83·64** (♀♀: 82·7) cm., **6·68** (♀♀: 6·40) kg.
cm.: 80, 81 (2), 82 (2), 83 (2), 84, 85, 86, 93 (♂).
kg.: 5·0, 5·5, 6·0 (3), 7·0 (4), 7·5, 9·5 (♂).

2.3: **47** Ind. (5 ♂, 42 ♀). Av.: **99·34** (♂♂: 104·8, ♀♀: 98·69) cm., **12·5** (♂♂: 14·5, ♀♀: 12·26) kg.
cm.: 88, 90 (2), 92 (3), 94, 95 (3), 96 (4), 97 (2), 98, 99 (3), 100 (8), 101 (2), 102 (5), 103 (3), 104 (2), 105 (3), 106 (2), 107, 110.
kg.: 8·0 (2), 9·0, 9·5, 10·0 (2), 10·5 (2), 11·0 (6), 11·5 (2), 12·0 (4), 12·5 (3), 13·0 (10), 14·0 (5), 14·5 (4), 15·0 (2), 15·5, 17·0 (2).

3.3: **144** Ind. (26 ♂, 118 ♀). Av.: **99·78** (♂♂: 102·88, ♀♀: 99·09) cm., **12·09** (♂♂: 12·97, ♀♀: 11·9) kg.
cm.: 88, 90 (2), 91, 92 (2), 93 (3), 94 (5), 95 (10), 96 (10), 97 (7), 98 (15), 99 (11), 100 (20), 101 (9), 102 (10), 103 (10), 104 (8), 105 (7), 106 (4), 107, 108 (5), 109 (2), 113.
kg.: 8·0, 8·5, 9·0 (7), 9·5 (3), 10·0 (14), 10·5 (3), 11·0 (16), 11·5 (10), 12·0 (28), 12·5 (9), 13·0 (13), 13·5 (8), 14·0 (22), 14·5, 15·0 (5), 15·5, 16·0 (2).

4.3: 1 ♀: 105 cm., 11·5 kg.

2.4: **5** ♂: cm.: 110 (3), 115 (2). Av.: **112·0** cm.
kg.: 14·0 (2), 17·2, 18·5, 19·0. Av.: **16·54**.

3.4: **10** Ind. (9 ♂, 1 ♀). Av.: **110·7** (♂♂: 110·33) cm., **17·02** (♂♂: 17·24) kg.
cm.: 107, 109 (2), 110 (3), 112 (2), 114, 114 (♀).
kg.: 14·0, 16·2, 16·5, 17·0 (2), 17·0 (♀), 17·5, 18·0, 18·5 (2).

Once spawned: **40** *Ind.*

6-year-olds:

3.1+G1: **4** Ind. (1 ♂, 3 ♀). Av.: **91·0** (♀♀: 90·0) cm., **8·75** (♀♀: 8·33) kg.
cm.: 89, 90, 91, 94 (♂).
kg.: 8·0 (2), 9·0, 10·0 (♂).

2.2+G1: 1 ♀: 97 cm., 11·0 kg.
3.2+G+: 1 ♂: 70 cm., 4·0 kg.

7-year-olds:

3.2+G1: **9** Ind. (1 ♂, 8 ♀). Av.: **93·89** (♀♀: 93·38) cm., **10·33** (♀♀: 10·31) kg.
cm.: 81, 90, 91, 92, 96, 98, 98 (♂), 99, 100.
kg.: 7·0, 8·0, 9·5, 10·5 (♂), 11·0 (3), 12·0, 13·0.

3.3G+: **4** Ind. (1 ♂, 3 ♀),
cm.: 96, 99, 104, 104 (♂). Av.: **100·75** (♀♀: 99·67)
kg.: 10·5, 11·0, 12·0, 13·5 (♂). Av.: **11·75** (♀♀: 11·17) kg.

8-year-olds:

3.1+G3: 1 ♂: 114 cm., 16·5 kg.

3.4G+: 2 ♂: 115 and 118 cm., 17·5 and 18·0 kg.
3.3G1: **16** Ind. (2 ♂, 14 ♀). Av.: **106·19** (♀♀: 105·64) cm., **13·69** (♀♀: 13·43) kg.
cm.: 97, 100, 103 (3), 106 (3), 107, 108, 109, 110 (2), 110 (2 ♂), 111.
kg.: 11·0 (3), 12·0, 13·0, 13·5, 14·0 (3), 14·5, 15·0 (4), 15·0 (♂), 16·0 (♂).

9-year-olds:

3.4G1: 1 ♀: 112 cm., 17·0 kg.
1 ♂: 118 cm., 16·0 kg.

Twice spawned: **2** *Ind.*

9-year-olds:

3.2+G1G1: 1 ♀: 109 cm., 13·0 kg.

10-year-olds:

3.3G1G1: 1 ♀: 109 cm., 13·0 kg.

1940: **712** Ind.

2.1+: **12** Ind. Av.: **48·42** cm., **1·30** kg.
cm.: 44 (2), 45 (2), 47 (3), 51 (3), 52, 57.
kg.: 1·0 (5), 1·3 (2), 1·5 (4), 2·0.

3.1+: **67** Ind. Av.: **50·34** cm., **1·51** kg.
cm.: 41 (2), 42, 44, 45 (3), 46 (7), 47 (2), 48 (5), 49 (6), 50 (8), 51 (7), 52 (5), 53 (2), 54 (7), 55 (6), 56 (3), 60, 61.
kg.: 0·6, 0·8, 0·9, 1·0 (14), 1·1, 1·2 (2), 1·3 (3), 1·5 (22), 1·6 (2), 2·0 (18), 2·5 (2).

4.1+: **3** Ind. cm.: 45, 47, 52. Av.: **48·0** cm.
kg. 1·0, 1·3, 1·5. Av.: **1·27**.

2.2+: **46** Ind. (11 ♂, 35 ♀). Av.: **78·02** (♂♂: 76·64, ♀♀: 78·46) cm., **5·73** (♂♂: 5·36, ♀♀: 5·84) kg.
cm.: 65, 70, 72 (3), 73 (2), 74 (2), 75 (6), 76 (5), 78 (5), 79 (3), 80 (4), 81 (2), 82 (2), 83 (2), 84 (5), 85 (3).
kg.: 3·5, 4·0 (2), 4·5 (4), 5·0 (11), 5·5 (6), 6·0 (8), 6·5 (5), 7·0 (5), 7·5 (3), 8·0.

3.2+: **305** Ind. (32 ♂, 273 ♀). Av.: **78·60** (♂♂: 81·63, ♀♀: 78·24) cm., **5·58** (♂♂: 6·44, ♀♀: 5·48) kg.
cm.: 64, 65, 67, 68 (2), 69 (2), 70 (6), 71 (5), 72 (4), 73 (13), 74 (16), 75 (28), 76 (11), 77 (23), 78 (29), 79 (30), 80 (31), 81 (15), 82 (30), 83 (21), 84 (14), 85 (12), 86 (4), 87, 88 (3), 89 (2).
kg.: 3·0 (4), 3·5 (2), 4·0 (35), 4·5 (25), 5·0 (72), 5·5 (31), 6·0 (57), 6·5 (21), 7·0 (42), 7·5 (7), 8·0 (6), 8·5 (2), 9·0.

4.2+: **29** Ind. (2 ♂, 27 ♀). Av.: **77·17** (♀♀: 77·0) cm., **4.95** (♀♀: 4·96) kg.
cm.: 71 (2), 72, 73 (3), 74 (2), 74 (♂), 75 (3), 76 (2), 77 (3), 78 (2), 79 (2), 80 (3), 81, 82, 84, 85 (♂), 89.
kg.: 3·5 (♂), 4·0 (7), 4·5 (7), 5·0 (4), 5·5 (5), 6·0 (3), 6·0 (♂), 9·0.

2.3: **17** Ind. (5 ♂, 12 ♀). Av.: **100·59** (♂♂: 105·8, ♀♀: 98·42) cm., **12·32** (♂♂: 14·0, ♀♀: 11·63) kg.
cm.: 91, 92, 95, 98, 99 (2), 99 (♂), 100 (3), 101, 102, 104, 105 (♂), 107 (2 ♂), 111 (♂).
kg.: 8·5, 9·5, 11·0 (2), 11·5, 12·0 (3), 12·0 (♂), 13·0 (4), 13·0 (♂), 15·0 (3 ♂).

3.3: **162** Ind. (30 ♂, 132 ♀). Av.: **99·89** (♂♂: 101·93, ♀♀: 99·42) cm., **11·91** (♂♂: 12·28, ♀♀: 11·83) kg.
cm.: 85, 86, 88 (2), 89, 90 (5), 91 (2), 92 (4), 94 (5), 95 (11), 96, 97 (4), 98 (15), 99 (11), 100 (30), 101 (12), 102 (11), 103 (7), 104 (12), 105 (11), 106, 107 (5), 108 (4), 109 (3), 110 (3).
kg.: 7·0, 7·5 (2), 8·0 (4), 8·5 (2), 9·0 (5), 9·5 (4), 10·0 (15), 10·5 (5), 11·0 (15), 11·5 (12), 12·0 (32), 12·5 (7), 13·0 (28), 13·5 (2), 14·0 (15), 15·0 (10), 16·0 (3).

4.3: **7** Ind. (1 ♂, 6 ♀), cm.: 93, 94, 96, 97, 101 (♂), 103 (2). Av.: **98·14** cm.
kg.: 9·0, 9·5, 10·0 (3), 13·0 (♂), 13·5. Av.: **10·71**.

2.4: **5** ♂: cm.: 110, 114, 115, 117, 118. Av.: **114·8** cm.
kg.: 15·0, 16·0, 18·0 (2), 19·0. Av.: **17·2** kg.

3.4: **22** Ind. (20 ♂, 2 ♀). Av.: **114·18** (♂♂: 114·35) cm., **16·27** (♂♂: 16·45) kg.
cm.: 109, 110, 111 (3), 112 (2), 112 (♀), 113 (♀), 114 (2), 115 (5), 116, 117, 118 (2), 119, 120.
kg.: 13·0, 14·0 (♀), 14·5, 15·0 (6), 15·0 (♀), 16·0, 16·5, 17·0 (2), 17·5, 18·0 (5), 18·5, 19·0.

3.5: 1 ♂: 123 cm., 23 kg.

Once spawned: **33** *Ind.*

4-year-olds:
2.1+G+: 1 ♀: 64 cm., 3·5 kg.

5-year-olds:
3.1+G+: 1 ♂: 67 cm., 3·5 kg.

6-year-olds:
3.1+G1: **10** Ind. (6 ♂, 4 ♀). Av.: **82·5** (♂♂: 84·67, ♀♀: 79·25) cm., **7·25** (♂♂: 7·75, ♀♀: 6·50) kg.
cm.: 71 (♀), 75 (♀), 80, 82, 83, 84, 85 (♀), 86 (♀), 89, 90.
kg.: 4·0 (♀), 6·0, 6·5 (♀), 7·0, 7·5 (♀), 8·0 (2), 8·0 (♀), 8·5, 9·0.

2.2+G1: 1 ♀: 99 cm., 12·5 kg.
3.2+G+: 1 ♀: 90 cm., 7·0 kg.

2·3G+: 1 ♀: 105 cm., 12·0 kg.

7-year-olds:
3·1+G2: 1 ♂: 110 cm., 14·0 kg.

2.3G+: 1 ♀: 105 cm., 12·0 kg.

3.2+G1: **7** Ind. (2 ♂, 5 ♀).
cm.: 89 (♂), 91 (♂), 93, 95, 96, 97, 102. Av.: **94·71** (♀♀: 96·60) cm.
kg.: 8·5 (♂), 9·5 (♂), 9·5, 10·0 (3), 12·0. Av.: **9·86** (♀♀: 10·30) kg.

3.3G+: 1 ♀: 107 cm., 14·5 kg. — 1 ♂: 113 cm., 15·5 kg.

8-year-olds:
3.3G1: **7** Ind. (1 ♂, 6 ♀).
cm.: 95, 101, 103, 104, 106, 110, 110 (♂). Av.: **104·14** (♀♀: 103·17) cm.
kg.: 9·5, 11·0 (2), 12·0 (2), 16·0, 16·0 (♂). Av.: **12·5** (♀♀: 11·92) kg.

Twice spawned: **1** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♀: 99 cm., 11·0 kg.

Three times spawned: **2** *Ind.*

12-year-olds:
3.3G1G1G1: 1 ♀: 113 cm., 12·0 kg. — 1 ♂: 119 cm., 18·0 kg.

3. Kemi River: Köngäs.

1936: **193** Ind.

3.2+: **59** Ind. (3 ♂, 56 ♀). Av.: **78·08** (♀♀: 77·82) cm., **5·31** (♀♀: 5·26) kg.
cm.: 67, 70, 71, 73, 74 (4), 75 (9), 76 (2), 77 (6), 78 (10), 79 (4), 80 (9), 80 (2 ♂), 81 (2), 82 (2), 83, 84, 89, 89 (♂), 94.
kg.: 4·0 (4), 4·5 (9), 5·0 (20), 5·0 (♂), 5·5 (7), 6·0 (13), 6·0 (♂), 7·0 (2), 7·5, 7·5 (♂).

4.2+: **14** ♀: cm.: 67, 70, 72, 75 (4), 77, 79, 80 (2), 81 (2), 85. Av.: **76·57** cm.
kg.: 3·0, 3·5, 4·0, 4·5 (2), 5·0 (4), 5·5, 6·0 (3), 7·0. Av.: **5·0** kg.

3.3: **60** Ind. (9 ♂, 51 ♀). Av.: **96·48** (♂♂: 101·89, ♀♀: 95·53) cm., **10·5** (♂♂: 12·77, ♀♀: 10·1) kg.
cm.: 87, 88, 89 (2), 90 (2), 91, 92 (6), 93 (7), 94 (6), 95 (2), 96 (3), 97, 98 (3), 99 (5), 100 (10), 101 (3), 102, 103 (2), 104 (2), 107, 108.
kg.: 7·0, 7·5 (2), 8·0 (8), 8·5 (4), 9·0 (7), 9·5 (5), 10·0 (4), 10·5 (2), 11·0 (4), 11·5 (4), 12·0 (7), 12·5 (4), 13·0 (3), 13·5, 14·5, 15·5 (2), 16·5.

4.3: **16** Ind. (3 ♂, 13 ♀). Av.: **96·69** (♂♂: 104·33, ♀♀: 94·92) cm., **10·71** (♂♂: 14·0, ♀♀: 9·95) kg.
cm.: 85, 90, 92 (2), 93 (2), 95, 96, 97, 98, 100 (2), 103, 104 (2 ♂), 105 (♂).
kg.: 7·0, 7·5, 9·0 (2), 9·5, 10·0 (2), 10·3, 11·0 (3), 12·0 (2), 13·0 (♂), 14·0 (♂), 15·0 (♂).

3.4: **12** Ind. (11 ♂, 1 ♀). Av.: **114·0** (♂♂: 113·73) cm., **18·04** (♂♂: 18·05) kg.
cm.: 106, 109, 112 (2), 113, 114, 115, 117 (3), 117 (♀), 119.
kg.: 15·5, 16·5, 17·5 (3), 18·0 (2), 18·0 (♀), 18·5 (2), 20·0, 21·0.

4.4: **2** ♂: 110 and 111 cm., 16·0 and 16·5 kg.

Once spawned: **27** *Ind.*

6-year-olds:
2.3G+: 1 ♀: 101 cm., 11·0 kg.

7-year-olds:
3.2+G1: **4** ♀: cm.: 91, 92, 97 and 100. Av.: **95·0** cm.
kg.: 8·0, 9·0, 9·5, and 11·0. Av.: **9·38** kg.

3.3G+: 2 ♀: cm.: 93 and 94, both 9·5 kg.

8-year-olds:
3.3G1: **19** Ind. (4 ♂, 15 ♀). Av.: **104·58** (♂♂:106·0, ♀♀: 104·2) cm., **12·74** (♂♂: 14·75, ♀♀: 12·2) kg.
cm.: 96, 98, 100, 101, 102, 104 (3), 105 (5), 106, 109 (3), 110 (2).
kg.: 9·5, 10·0 (2), 11·0, 11·5, 12·0, 12·5 (4), 13·0 (2), 13·5, 14·5, 15·0 (3), 16·5.

9-year-olds:
3.4G1: 1 ♀: 111 cm., 16·0 kg. — 1 ♂: 117 cm., 16·0 kg.

Twice spawned: **1** *Ind.*

7-year-olds:
3.2+G+G+: 1 ♀: 96 cm., 9·0 kg.

1937: **65** Ind.

2.2+: 2 ♀: cm.: 70 and 78. — kg. 3·5 and 5·5.
3.2+: **15** ♀: cm.: 62, 68, 70, 71, 72, 73 (2), 74, 75 (2), 76, 78, 81, 82, 85. Av.: **74·33** cm.
kg.: 2·5, 3·5 (3), 4·0, 4·5 (3), 5·0, 5·5 (3), 6·0, 7·0, 7·5. Av.: **4·83** kg.
4.2+: **7** ♀: cm.: 72 (3), 74, 75 (2), 80. Av.: **74·29** cm.
kg.: 3·5, 3·8, 4·5 (2), 4·7, 5·0, 5·5. Av.: **4·5** kg.

3.3: **33** Ind. (8 ♂, 25 ♀). Av.: **97·15** (♂♂: 103·88, ♀♀: 95·0) cm., **10·8** (♂♂: 12·88, ♀♀: 10·14) kg.
cm.: 83, 85, 89, 90 (2), 91 (3), 93, 95 (3), 96, 97 (3), 98 (3), 99 (3), 100 (3), 102, 104 (2), 105 (2), 106 (2), 108.
kg.: 6·0, 7·0 (2), 7·5 (2), 9·0 (3), 9·5 (2), 10·0 (3), 10·5 (2), 11·0 (4), 11·5 (4), 12·0 (2), 12·5 (2), 13·5 (2), 14·0, 14·5 (2), 15·5.
4.3: 2 ♀: 87 a. 92 cm., 8·0 and 9·5 kg. — 2 ♂: 100 and 103 cm., 12·0 and 13·0 kg.

3.4: 1 ♂: 114 cm., 21·5 kg.
4.4: 1 ♂: 118 cm., 17·5 kg.

Once spawned: **3** *Ind.*

8-year-olds:
3.3G1: **3** ♀: cm.: 105 (2), and 108. — kg.: 12·5, 14·0, 15·5.

Three times spawned: **1** *Ind.*

12-year-olds:
3.3G1G1G1: 1 ♀: 104 cm., 13·5 kg.

1938: **171** Ind.

3.1+: **16** Ind. Av.: **56·19** cm., **2·08** kg.
cm.: 52, 53, 54 (4), 55 (3), 56, 57, 59, 60 (3), 61.
kg.: 1·5, 1·8 (3), 1·9, 2·0 (6), 2·1, 2·5 (3), 2·8.

2.2+: **15** Ind. (3 ♂, 12 ♀). Av.: **82·33** (♀♀: 81·08) cm., **6·87** (♀♀: 6·5) kg.
cm.: 73, 76, 78, 79 (2), 80, 83 (2), 84 (3), 85, 88 (2), 91.
kg.: 4·0, 4·5, 5·0, 6·0 (2), 7·0 (3), 7·5 (4), 8·5, 9·0 (2).
3.2+: **48** Ind. (4 ♂, 44 ♀). Av.: **78·13** (♀♀: 78·68) cm., **5·44** (♀♀: 5·45) kg.
cm.: 63, 70 (2), 71 (2), 72 (2), 74, 75 (3), 76 (3), 77 (3), 78 (7), 79 (2), 80 (9), 81 (5), 82 (2), 84 (3), 85, 86, 87.
kg.: 3·0, 4·0 (3), 4·5 (6), 5·0 (10), 5·3, 5·5 (14), 6·0 (5), 6·5 (2), 6·7 7·0 (3), 7·5, 8·5.
4.2+: **5** ♀: cm.: 78, 80 (2), 81, 84. Av.: **80·6** cm.
kg.: 5·5 (3), 6·0, 7·5. Av.: **6·0** kg.

2.3: **2** ♀: 92 and 94 cm., 8·0 and 9·0 kg.
3.3: **43** Ind. (10 ♂, 33 ♀). Av.: **96·93** (♂♂: 99·40, ♀♀: 96·18) cm., **10·53** (♂♂: 11·85, ♀♀: 10·10) kg.
cm.: 88 (2), 90 (3), 91 (2), 92 (3), 94 (2), 95 (4), 96 (2), 97 (4), 98 (3), 99 (2), 100 (7), 101 (3), 102 (2), 103, 104, 105 (2).
kg.: 7·2, 7·5 (2), 8·5 (2), 9·0 (4), 9·5 (5), 10·0 (9), 10·5 (4), 11·0 (5), 11·5 (3), 12·0, 12·5, 13·0 (2), 13·5, 14·5 (3).
4.3: **9** Ind. (2 ♂, 7 ♀). Av.: **95·89** (♀♀: 95·43) cm., **10·39** (♀♀: 10·21) kg.
cm.: 88 (2), 92, 94 (♂), 95, 100 (2), 101 (♂), 105.
kg.: 8·5 (2), 9·5 (2), 11·0 (2 ♂), 11·5 (2), 12·5.

3.4: **10** Ind. (9 ♂, 1 ♀). cm.: 105 (♀), 110 (5), 115, 116, 118 (2). Av.: **112·2** cm. — kg.: 13·0 (♀), 13·0, 14·0, 15·0 (2), 15·5 (3), 18·0, 21·0. Av.: **15·55**.
4.4: 1 ♂: 112 cm., 17·0 kg.

Once spawned: **20** *Ind.*

6-year-olds:
3.1+G1: **5** ♀: cm.: 70, 75, 77, 82, 83. Av.: **77·4** cm.
kg.: 4·5, 5·0, 5·7, 6·5, 7·5. Av.: **5·84** kg.
3.2+G+: 1 ♀: 85 cm., 8·0 kg.

7-year-olds:
3.2+G1: 3 ♀: cm.: 88, 91, 96. Av.: **91·67** cm.
kg.: 7·5, 9·0, 10·0. Av.: **8·83** kg.

2.3G1: 1 ♀: 103 cm., 11·0 kg.

8-year-olds:
3.2+G2: 1 ♂: 108 cm., 16·5 kg.
4.2+G1: 1 ♀: 95 cm., 8·5 kg.

3.4G+: 1 ♂: 115 cm., 16·5 kg.

3.3G1: **4** Ind. 3 ♀: cm.: 98, 105, 107. Av.: **103.33** cm.
kg.: 9·0, 14·0, 17·0. Av.: **13·33** kg. — 1 ♂: 102 cm., 10·5 kg.

9-year-olds:
3.4G1: 2 ♂: 114 and 115 cm., 16·0 and 16·5 kg. — 1 ♀: 111 cm., 15·0 kg.

4.3G1: 1 ♀: 103 cm., 11·0 kg.

Twice spawned: **1** *Ind.*

10-year-olds:
3.3G1G1: 1 ♂: 106 cm., 16·0 kg.

1939: **275** Ind.

2.1+: **19** Ind. Av.: **54·37** cm., **1·85** kg.
cm.: 48, 49, 50 (2), 53 (5), 54 (2), 55 (2), 57 (2), 58, 59, 60, 62.
kg.: 1·2, 1·3 (2), 1·4, 1·5 (2), 1·8 (3), 1·9, 2·0 (5), 2·2, 2·3, 2·5, 2·7.
3.1+: **82** Ind. Av.: **53·02** cm., **1·69** kg.
cm.: 44, 45 (2), 46 (2), 47 (2), 48 (3), 49, 50 (13), 51 (6), 52 (9), 53 (7), 54 (6), 55 (7), 56 (6), 57 (6), 58 (5), 60 (4), 61, 62.
kg.: 0·8 (3), 1·0 (5), 1·3 (9), 1·4 (2), 1·5 (25), 1·8 (8), 1·9, 2·0 (19), 2·1, 2·3, 2·5 (7), 3·0.
4.1+: **6** Ind. cm.: 51, 52, 53, 57, 58, 61. Av.: **55·33** cm.
kg.: 1·4, 1·5 (2), 2·0, 2·5 (2). Av.: **1·9** kg.

2.2+: **6** Ind. (2 ♂, 4 ♀). cm.: 70 (♂), 72, 78, 80, 85, 85 (♂). Av.: **78·33** cm. — kg.: 4·0, 5·0, 6·0 (♂), 6·5 (2), 7·0 (♂). Av.: **5·83** kg.
3.2+: **83** Ind. (10 ♂, 73 ♀). Av.: **80·06** (♂♂: 82·30, ♀♀: 79·75) cm., **5·77** (♂♂: 6·36, ♀♀: 5·68) kg.
cm.: 70 (3), 72 (2), 73, 75 (6), 76 (3), 77 (3), 78 (11),

79 (4), 80 (18), 81 (5), 82 (9), 83, 84 (2) 85 (6), 86 (5), 88, 89, 90, 94.
kg.: 3·0 (2), 4·0 (3), 4·5 (13), 5·0 (11), 5·5 (19), 6·0 (12), 6·5 (7), 7·0 (9), 8·0, 8·5 (2), 9·0 (2), 10·0 (2).

4.2+: 3 ♀: cm.: 77, 79, 81. Av.: **79·0** cm. — kg.: 4·5, 5·0, 6·0. Av.: **5·17** kg.

2.3: **14** Ind. (4 ♂, 10 ♀). Av.: **100·36** (♂♂: 103·0, ♀♀: 99·3) cm., **12·18** (♂♂: 12·63, ♀♀: 12·0) kg.
cm.: 95 (2), 96, 100 (5), 100 (♂), 102, 102 (♂), 105, 105 (2 ♂).
kg.: 9·5, 11·0 (3), 12·0 (2), 12·0 (2 ♂), 12·5, 12·5 (♂), 13·0, 13·5, 14·0 (♂), 14·5.

3.3: **40** Ind. (11 ♂, 29 ♀). Av.: **99·7** (♂♂: 103·82, ♀♀: 98·14) cm., **11·62** (♂♂: 13·27, ♀♀: 10·99) kg.
cm.: 90, 93 (2), 95 (4), 96 (6), 97, 98 (5), 100 (5), 101, 102 (3), 103 (3), 105 (5), 106, 107 (2), 108.
kg.: 7·5, 8·0, 9·0 (3), 9·5, 10·0 (3), 10·5 (4), 11·0 (3), 11·5 (4), 12·0 (5), 12·5 (5), 13·0 (2), 13·5 (3), 14·0, 14·5 (3), 15·5.

3.4: **4** Ind. (3 ♂, 1 ♀): cm.: 110 (2), 112, 118 (♀). Av.: **112·5** cm. — kg.: 14·5, 14·5 (♀), 15·5, 16·5. Av.: **15·25** kg.

Once spawned: **17** *Ind.*

5-year-olds:
2.1+G1: 1 ♂: 86 cm., 7·5 kg.
3.1+G+: 1 ♀: 67 cm., 3·0 kg.

6-year-olds:
3.1+G1: 1 ♀: 90 cm., 9·0 kg.

2.2+G1: 1 ♀: 92 cm., 10·5 kg.
3.2+G+: 1 ♀: 78 cm., 5·0 kg.

7-year-olds:
3.2+G1: 3 ♀: cm.: 91, 92, 100. Av.: **94·33** cm.
kg.: 9·0, 10·0 (2). Av.: **9·67** kg.
3.3G+: **6** Ind. (2 ♂, 4 ♀): cm.: 90, 101, 102 (2), 104 (♂), 105 (♂). Av.: **100·67** cm.
kg.: 8·0, 11·0 (2), 11·5, 12·5 (♂), 14·0 (♂). Av.: **11·33** kg.

8-year-olds:
3.3G1: 2 ♀: 99 and 108 cm., 11·5 and 15·0 kg.

9-year-olds:
3.4G1: 1 ♀: 112 cm., 18·0 kg.

Twice spawned: **1** *Ind.*

8-year-olds:
3.3G+G+: 1 ♀: 98 cm., 10·5 kg.

1940: **149** Ind.

2.2+: **7** ♀: cm.: 60, 68, 70, 76, 78, 81, 86. Av.: **74·14** cm.
kg.: 3·0, 3·5, 4·5, 5·0, 6·0 (2), 8·0. Av: **5·14** kg.

3.2+: **54** Ind. (1 ♂, 53 ♀). cm.: 65 (2), 66 (2), 67 (2), 68, 69, 70 (3), 71, 72, 73 (2), 74 (♂), 74 (2), 75 (8), 76, 77 (5), 78 (11), 79 (2), 80, 81 (3), 82 (2), 83 (2), 87. Av.: **75·39** cm.
kg.: 3·0 (3), 3·5 (2), 4·0 (10), 4·0 (♂), 4·5 (11), 5·0 (11), 5·5 (6), 6·0 (7), 6·5 (3). Av.: **4·80** kg.

4.2+: **9** ♀: cm.: 65, 70, 71, 74, 75, 80, 81, 82, 83. Av.: **75·67** cm.
kg.: 4·0, 4·5 (2), 5·0 (2), 5·5, 6·0, 6·5 (2). Av.: **5·27** kg.

2.3: **2** ♀: 91 and 99 cm., 9·0 and 10·0 kg.

3.3: **59** Ind. (4 ♂, 55 ♀). Av.: **96·68** (♂♂: 101·25, ♀♀: 96·35) cm., **10·26** (♂♂: 11·38, ♀♀: 10·18) kg.
cm.: 89, 90 (4), 91 (2), 92 (3), 93 (5), 94 (4), 95 (5), 96 (8), 97 (3), 98 (6), 99, 100 (8), 101 (2), 102, 104, 105 (3), 106 (2).
kg.: 7·0, 7·5 (2), 8·0 (5), 9·0 (6), 9·5 (7), 10·0 (11), 10·5 (5), 11·0 (8), 11·5 (4), 12·0 (7), 13·0, 14·5, 15·0.

4.3: 1 ♂: 107 cm., 12·5 kg. — 1 ♀: 94 cm., 10·5 kg.

3.4: 3 ♂: cm.: 112, 117 (2). Av.: **115·33** cm. — kg.: 15·5 (2), 17·0. Av.: **16·0** kg.

Once spawned: **11** *Ind.*

6-year-olds:
3.1+G1: **3** ♀: cm.: 77, 78, 85. Av.: **80·0** cm.
kg.: 5·5 (2), 6·5. Av.: **5·83** kg.

7-year-olds:
3.2+G1: **5** ♀: cm.: 85, 94, 95, 96, 97. Av.: **93·4** cm.
kg.: 7·5, 9·0 (2), 10·0 (2). Av.: **9·1** kg.

8-year-olds:
3.3G1: **3** ♀: cm.: 100 (2), 101. Av.: **100·33** cm.
kg.: 9·5, 10·0, 12·0. Av.: **10·5** kg. — 1 ♂: 118 cm., 17·0 kg.

Twice spawned: **2** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♂: 100 cm., 12·5 kg.

11-year-olds:
4.3G1G1: 1 ♂: 117 cm., 16·5 kg.

1941: **199** Ind.

2.2+: **9** ♀: cm.: 64, 69, 70 (2), 71, 73, 75, 80 (2). Av.: **72·44** cm. — kg.: 3·0, 3·5 (4), 4·0, 5·0, 5·5, 6·0. Av.: **3·75** kg.

3.2+: **10** ♀: cm.: 64, 65, 66, 70, 71, 72, 75 (2), 76 (2). Av.: **71·0** cm. — kg.: 3·5 (2), 4·0 (3), 5·0 (3), 5·5, 7·0. Av.: **4·65** kg.

4.2+: 2 ♀: 60 and 80 cm., 3·5 and 5·0 kg.

2.3: **10** Ind. (1 ♂, 9 ♀). cm.: 92, 95 (2), 96 (2), 97 (♂), 98, 99, 100, 104. Av.: **97·20** cm.
kg.: 9·5 (3), 10·0, 10·5, 11·5 (2), 12·0, 12·0 (♂), 15·0. Av.: **11·10** kg.

3.3: **123** Ind. (22 ♂, 101 ♀). Av.: **96·52** (♂♂: 101·91, ♀♀: 95·33) cm., **10·14** (♂♂: 11·41, ♀♀: 9·86) kg.
cm.: 85 (2), 88 (2), 89 (2), 90 (7), 91 (6), 92 (7), 93 (5), 94 (7), 95 (14), 96 (11), 97 (5), 98 (15), 99 (9), 100 (9), 101 (3), 102 (4), 103 (4), 104 (6), 105 (4), 106.

kg.: 7·0 (5), 7·5 (4), 8·0, 8·5 (11), 9·0 (16), 9·5 (8), 10·0 (27), 10·5 (12), 11·0 (15), 11·5 (6), 12·0 (7), 13·0 (6), 13·5 (3), 14·0 (2).

4.3: 1 ♀: 96 cm., 11·5 kg.

3.4: **20** Ind. (15 ♂, 5 ♀), Av.: **112·75** (♂♂: 112·27, ♀♀: 114·20) cm., **15·43** (♂♂: 15·1, ♀♀: 16·4) kg.
cm.: 107 (2), 109, 110 (2), 111, 112 (6), 114 (2), 115 (2), 116, 117, 118, 120.
kg.: 12·0, 13·0 (2), 13·5 (3), 14·0, 15·0 (3), 15·5, 16·0 (2), 16·5, 17·0 (2), 18·0 (3), 19·0.

4.4: 1 ♂: 116 cm., 13·5 kg.

3.5: 2 ♂: both 120 cm. and 19·5 kg.

Once spawned: **21** *Ind.*

5-year-olds:
2.1+G1: 1 ♂: 80 cm., 6·5 kg.

6-year-olds:
3.1+G1: **5** Ind. (1 ♂, 4 ♀) cm.: 68, 72, 80, 87, 89 (♂). Av.: **79·2** cm.
kg.: 4·0 (2), 6·0, 7·0, 7·0 (♂). Av.: **5·6** kg.

3.2+G+: **3** ♀: cm.: 80 (2), 88. Av.: **82·67** cm.
kg.: 5·5, 6·5, 7·0. Av.: **6·33** kg.

7-year-olds:
3.2+G1: **6** ♀: cm.: 92, 95, 96, 97, 100 (2). Av.: **96·67** cm.
kg.: 10·0 (2), 10·5, 11·0, 12·0 (2). Av.: **10·92** kg.
2.3G1: 2 ♀: both 102 cm., 10·5 and 11·5 kg.

8-year-olds:
3.3G1: **3** ♀: cm.: 97, 108, 110. Av.: **105·0** cm.
kg.: 10·0, 11·5, 12·0. Av.: **11·17** kg. — 1 ♂: 111 cm., 13·5 kg.
4.2+G1: 1 ♀: 94 cm., 10·5 kg.

1942: **125** Ind.

3.2+: **9** Ind. (1 ♂, 8 ♀). cm.: 64 (♂), 67, 69, 70, 72 (2), 75, 78 (2). Av.: **71·67** cm.
kg.: 2·5 (♂), 3·2, 3·4 (2), 3·5, 4·0 (2), 4·5, 4·9. Av.: **3·71** kg.

4.2+: **2** ♀: 68 and 85 cm., 3·3 and 6·8 kg.

2.3: **4** ♀: cm.: 85, 87, 88, 90. Av.: **87·5** cm. — kg.: 5·8, 6·8, 8·0, 8·5. Av.: **7·28** kg.

3.3: **87** Ind. (5 ♂, 82 ♀). Av.: **89·47** (♂♂: 94·0, ♀♀: 84·07) cm., **7·43** (♂♂: 9·5, ♀♀: 7·31) kg.
cm.: 78, 79, 80 (2), 81, 82 (2), 83 (2), 84 (7), 85 (5), 86 (7), 87 (3), 88 (9), 90 (11), 91 (5), 92 (6), 93 (6), 94, 95 (6), 96 (2), 97 (5), 98 (4), 100.
kg.: 5·0 (4), 5·5 (7), 6·0 (8), 6·5 (8), 7·0 (18), 7·5 (11), 8·0 (10), 8·5 (5), 9·0 (5), 9·5 (2), 10·0 (4), 10·5 (2), 11·0 (3).

3.4: **7** Ind. (5 ♂, 2 ♀). cm.: 104 (♀), 110, 112, 115, 115 (♀), 117, 118. Av.: **113·0** (♂♂: 109·5, ♀♀: 114·4) cm.
kg.: 13·0 (♀), 14·0 (2), 14·5, 15·5, 15·5 (♀), 16·0. Av.: **14·64** (♂♂: 14·8, ♀♀: 14·25) kg.

Once spawned: **3** *Ind.*

6-year-olds:
2.2+G1: 1 ♀: 98 cm., 9·5 kg.

7-year-olds:
3.2+G1: 1 ♀: 98 cm., 9·0 kg.

8-year-olds:
3.3G1: 1 ♀: 108 cm., 14·0 kg.

Twice spawned: **1** *Ind.*

10-year-olds:
3.3G1G1: 1 ♂: 111 cm., 15·0 kg.

1943: **159** Ind.

2.3: **6** Ind. (1 ♂, 5 ♀). cm.: 80, 83, 84, 85, 93, 95 (♂). Av.: **86·67** (♀♀: 85·0) cm.
kg.: 5·5, 6·0 (2), 6·5, 10·0, 10·0 (♂). Av.: **7·33** (♀♀: 6·8) kg.

3.3: **119** Ind. (4 ♂, 115 ♀). Av.: **85·35** (♂♂: 85·0, ♀♀: 85·37) cm., **6·85** (♂♂: 6·50, ♀♀: 6·87) kg.
cm.: 72, 73, 74, 76, 77 (2), 78 (3), 79 (4), 80 (10), 81 (4), 82 (3), 83 (3), 84 (14), 85 (13), 86 (12), 87 (12), 88 (4), 89 (5), 90 (12), 91 (4), 92 (3), 94 (4), 95, 97 (2).
kg.: 4·0 (3), 4·5 (4), 5·0 (7), 5·5 (7), 6·0 (21), 6·5 (15), 7·0 (19), 7·5 (14), 8·0 (15), 8·5 (4), 9·0 (5), 9·5 (2), 10·5 (2), 11·5.

4.3: 2 ♀: 85 and 94 cm., both 8·0 kg.

2.4: **5** Ind. (2 ♂, 3 ♀). cm.: 94, 97, 99 (♂), 105, 107 (♂). Av.: **100·4** (♀♀: 98·67) cm. — kg.: 9·0 (♂), 9·0, 10·0, 11·0, 13·0 (♂). Av.: **10·4** (♀♀: 10·0) kg.

3.4: **22** Ind. (8 ♂, 14 ♀). Av.: **100·55** (♂♂: 103·63, ♀♀: 98·79) cm., **10·93** (♂♂: 11·5, ♀♀: 10·61) kg.
cm.: 89, 92, 95, 96 (2), 98 (3), 99 (3), 100 (2), 102, 103 (2), 104 (2), 105, 110 (2), 112.
kg.: 8·0 (4), 9·0, 10·0 (3), 10·5, 11·0 (5), 11·5 (2), 12·0, 13·0 (3), 14·0, 16·0.

Once spawned: **5** *Ind.*

6-year-olds:
3.2+G+: 1 ♀: 77 cm., 4·3 kg.

7-year-olds:
3.2+G1: 2 ♀: 83 and 84 cm., both 6·5 kg.

8-year-olds:
4.2+G1: 1 ♀: 87 cm., 6·5 kg.

3.3G1: 1 ♂: 108 cm., 13·5 kg.

1944: **63** Ind.

3.1+: **3** Ind. cm.: 52, 53, 57. Av.: **54·0** cm. — kg.: 1·5 (2), 2·0. Av.: **1·67** kg.

2.2+: **4** Ind. cm.: 63 (2), 64, 68. Av.: **64·5** cm. — kg.: 2·6, 2·7, 2·8, 3·6. Av.: **2·93** kg.

3.2+: **26** Ind. cm.: 60, 61, 62 (2), 64 (2), 65 (4), 66 (3), 67 (3), 68 (2), 69, 70 (3), 71, 74 (3). Av.: **66·92** cm.
kg.: 2·3, 2·4, 2·5 (2), 2·7 (2), 2·8, 3·0 (6), 3·2, 3·5 (4), 3·7 (2), 3·8 (2), 4·0 (2), 4·1, 4·2. Av.: **3·25** kg.

4.2+: **1** Ind.: 70 cm., 4·0 kg.

2.3: **2** Ind.: 75 and 76 cm., 4·5 and 5·3 kg.
3.3: **7** Ind. cm.: 74, 75, 76, 77, 83, 85 (2). Av.: **79·29** cm.
kg.: 4·5, 5·0 (2), 5·5 (2), 6·0, 7·0. Av.: **5·5** kg.

3.4: **15** Ind. cm.: 85, 88, 89, 90 (2), 91, 92, 94, 95 (2), 97, 99, 101, 106, 111. Av.: **94·86** cm.
kg.: 7·0 (3), 7·3, 7·8, 8·0, 8·5, 8·7, 9·0 (2), 9·5, 10·0, 12·0, 12·5, 16·0. Av.: **9·29** kg.

Once spawned: **4** *Ind.*

4-year-olds:
2.1+G+: 1 Ind.: 60 cm., 2·6 kg.

7-year-olds:
3.3G+: 1 Ind.: 97 cm., 8·8 kg.

8-year-olds:
3.3G1: 2 Ind.: 93 and 96 cm., 8·0 and 11·0 kg.

Twice spawned: **1** *Ind.*

8-year-olds:
3.3G+G+: 1 Ind. 97 cm., 8·5 kg.

4. Kemi River: Muurola.

1936: **225** Ind.

2.2+: **3** ♀: cm.: 73, 75 and 80. — kg.: 5·5, 6·0 and 6·0.
3.2+: **40** Ind. (1 ♂, 39 ♀). Av.: **80·35** cm., **5·78** kg.
cm.: 68, 72, 73, 74, 75 (4), 76, 77, 78 (3), 78 (♂), 79, 80 (8), 81 (3), 82, 83 (2), 84 (2), 85 (5), 87, 88 (2), 96.
kg.: 4·5 (♂), 4·5 (2), 5·0 (9), 5·5 (6), 6·0 (14), 6·5 (3), 7·0 (4), 8·0.
4.2+: **10** ♀: cm.: 73, 74, 75 (2), 78, 79, 80 (2), 82, 85. Av.: **78·1** cm.
kg.: 4·0, 4·5 (2), 5·0 (2), 5·5, 6·0, 6·5, 7·0 (2). Av.: **5·5** kg.

2.3: **4** Ind. (2 ♂, 2 ♀). cm.: 99, 101 (♀), 102, 106 (♀). Av.: **102·0** cm.
kg.: 10·5, 13·0 (♀), 14·0, 15·0 (♀). Av.: **13·13**.
3.3: **103** Ind. (19 ♂, 84 ♀). Av.: **98·29** (♂♂: 102·0, ♀♀: 97·45) cm., **10·85** (♂♂: 12·68, ♀♀: **10·43**) kg.
cm.: 88, 89 (2), 90, 91 (5), 92 (2), 93 (3), 94 (4), 95 (19), 96 (4), 97 (3), 98 (5), 99 (7), 100 (19), 101 (6), 102 (2), 103 (5), 104 (5), 105 (4), 106 (2), 107, 108, 109, 110.
kg.: 7·0 (2), 7·5, 8·0 (8), 8·5 (3), 9·0 (17), 9·5 (2), 10·0 (13), 10·5 (2), 11·0 (14), 11·5 (2), 12·0 (17), 12·5, 13·0 (11), 13·5 (2), 14·0 (4), 15·0, 16·0 (2), 17·0.
4.3: **9** Ind. (3 ♂, 6 ♀). Av.: **100·56** (♂♂: 102·0, ♀♀: 99·83) cm., **11·56** (♂♂: 11·83, ♀♀: 11·42) kg.
cm.: 96 (2), 100 (3), 101, 102, 105 (2).
kg.: 10·5, 11·0 (5), 12·0, 13·0, 13·5.

2.4: **3** Ind. (2 ♂, 1 ♀). cm.: 109, 110 (♀), 113. Av.: **110·67** cm.
kg.: 16·0, 18·5 (♀), 19·5. Av.: **18·0** kg.
3.4: **21** Ind. (17 ♂, 4 ♀). Av.: **112·52** (♂♂: 112·53, ♀♀: 112·5) cm., **16·93** (♂♂: 17·15, ♀♀: 16·0) kg.
cm.: 107, 108, 109 (5), 110, 111 (2), 114 (2), 115 (5), 116, 117 (2), 118.
kg.: 13·0, 15·0 (4), 15·5 (2), 16·0 (2), 17·0 (3), 18·0 (4), 19·0 (4), 20·5.
4.4: **5** ♂: cm.: 109, 110, 115, 116 (2). Av.: **113·2** cm.
kg.: 15·0, 16·0, 17·0, 18·0, 20·0. Av.: **17·2** kg.

3.5: **2** ♂: 120 and 124 cm., 19·0 and 24·5 kg.

Once spawned: **25** *Ind.*

7-year-olds:
3.1+G2: 1 ♂: 100 cm., 12·0 kg.

2.3G1: 1 ♀: 109 cm., 15·0 kg.
3.3G+: 1 ♀: 111 cm., 9·0 kg.

8-year-olds:
4.2+G1: 1 ♀: 100 cm., 12·0 kg.

2.4G1: 1 ♀: 113 cm., 18·5 kg.

3.3G1: **20** Ind. (1 ♂, 19 ♀). Av.: **106·35** cm., **13·03** kg.
cm.: 100 (♂), 100, 101, 104, 105 (3), 106 (6), 107, 108, 110 (3), 112, 114.
kg.: 10·0, 11·2 (2), 12·0 (5), 13·0 (♂), 13·0 (3), 14·0 (3), 14·5 (2), 15·0 (2), 15·5.

1937: **77** Ind.

3.2+: **1** ♀: 75 cm., 5·0 kg.
4.2+: **3** ♀: cm.: 70, 80 (2). — kg.: 4·0, 6·0 (2).

2.3: **1** ♀: 95 cm., 9·0 kg.
3.3: **50** Ind. (13 ♂, 37 ♀). Av.: **99·12** (♂♂: 100·31, ♀♀: 98·70) cm., **11·15** (♂♂: 11·85, ♀♀: 10·91) kg.
cm.: 85, 88, 90 (4), 93, 94, 95 (11), 96, 97, 98, 99 (3), 100 (8), 101 (2), 103, 104, 105 (7), 108, 110 (4), 111.
kg.: 6·5, 7·0, 8·0 (3), 8·5, 9·0 (5), 10·0 (4), 10·5, 11·0 (14), 11·5 (4), 12·0 (2), 13·0 (5), 13·5 (2), 14·0 (6), 16·0.
4.3: **2** ♀: 95 and 97 cm., 9·0 and 11·0 kg.
5.3: **2** ♂, **1** ♀: cm.: 105 (♀), 105, 109. — kg.: 12·0, 15·0 (♀), 15·0.

3.4: **5** ♂: cm.: 110 (3), 115 (2). Av.: **112·0** cm.
kg.: 14·5, 15·0, 17·5, 18·0, 19·0. Av.: **16·8** kg.
4.4: **1** ♂: 115 cm., 16·0 kg.

3.5: **2** ♂: 118 and 120 cm., 19·5 and 20·0 kg.
4.5: **1** ♂: 118 cm., 20·0 kg.

Once spawned: **7** *Ind.*

6-year-olds:
2.2+G1: 1 ♀: 97 cm., 12·0 kg.

7-year-olds:
3.2+G1: 1 ♀: 91 cm., 9·0 kg.

8-year-olds:
4.2+G1: 1 ♀: 99 cm., 7·0 kg.

3.3G1: 3 ♀: cm.: 100, 105 and 108; kg.: 12·0, 15·0 (2). — 1 ♂: 110 cm., 14·0 kg.

Twice spawned: 1 *Ind.*

10-year-olds:
3.3G1G1: 1 ♀: 110 cm., 16·0 kg.

1938: **189** Ind.

3.1+: **3** ♀: each 55 cm., 1·5 and 2·0 (2) kg.

2.2+: **8** Ind. (1 ♂, 7 ♀). Av.: **84·0** (♀♀: 83·14) cm., **6·31** (♀♀: 6·14) kg.
cm.: 70, 83, 85 (3), 87 (2), 90 (♂).
kg.: 4·0, 5·5, 6·0, 6·5 (2), 7·0, 7·5, 7·5 (♂).

3.2+: **44** ♀: cm.: 71 (2), 73, 74, 75, 76, 77 (3), 78 (3), 79 (4), 80 (9), 81 (3), 82 (5), 83 (4), 85 (4), 86, 87, 89. Av.: **80·18** cm.
kg.: 4·0, 4·5 (3), 5·0 (14), 5·5 (8), 6·0 (12), 6·5 (3), 7·0, 8·0, 8·5. Av.: **5·6** kg.

2.3: **7** Ind. (2 ♂, 5 ♀). Av.: **97·43** (♀♀: 96·4) cm., **10·07** (♀♀: 9·4) kg.
cm.: 90, 95, 97, 99 (♂), 100 (2), 101 (♂).
kg.: 8·0, 8·5, 9·5, 10·0, 10·5 (♂), 11·0, 13·0 (♂).

3.3: **58** Ind. (9 ♂, 49 ♀). Av.: **98·24** (♂♂: 102·22, ♀♀: 97·51) cm., **10·09** (♂♂: 12·06, ♀♀: 9·72) kg.
cm.: 87, 88 (2), 89 (2), 90 (2), 92 (2), 93 (3), 94 (3), 95 (6), 96 (4), 97 (2), 98, 99 (5), 100 (11), 101, 102 (2), 103 (2), 104, 105, 106, 108 (2), 109, 112, 113, 115.
kg.: 7·0 (4), 7·5 (3), 8·0 (4), 8·5 (4), 9·0 (6), 9·5 (6), 10·0 (8), 10·5 (4), 11·0 (4), 11·5 (3), 12·0, 12·5 (2), 13·0 (5), 13·5 (2), 14·0 (2).

4.3: **15** ♀: cm.: 90 (2), 92, 93 (2), 95 (4), 96, 97, 98, 99, 102, 111. Av.: **96·07** cm.
kg.: 8·0, 8·5, 9·0 (5), 9·5 (2), 10·0, 11·0 (2), 11·5 (2), 12·0. Av.: **9·83** kg.

3.4: **37** Ind. (32 ♂, 5 ♀). Av.: **114·51** (♂♂: 114·91, ♀♀: 112·0) cm., **16·26** (♂♂: 16·64, ♀♀: 13·8) kg.
cm.: 105 (♀), 105, 109, 110 (♀), 110 (4), 111 (2), 112 (♀), 112 (3), 115 (♀), 115 (7), 116 (2), 117 (5), 118 (♀), 118, 120 (4), 121, 124.
kg.: 11·0 (♀), 12·0, 12·5 (♀), 13·0 (♀), 14·0 (♀), 14·0 (3), 15·0 (6), 15·5 (2), 16·0 (2), 16·5 (3), 17·0 (5), 17·5 (2), 18·0 (2), 18·5 (♀), 18·5, 20·0, 20·5, 22·0.

4.4: **2** ♂: 109 and 117 cm., 14·0 and 18·0 kg.

Once spawned: **14** *Ind.*

6-year-olds:
3.1+G1: 1 ♀: 73 cm., 6·0 kg.

7-year-olds:
3.1+G2: 1 ♂: 99 cm., 10·3 kg.

3.2+G1: 6 ♀: cm.: 79, 81, 89, 94 (2), 95. Av.: **88·67** cm.
kg.: 7·0, 7·5, 8·0, 8·5 (2), 9·0. Av.: **8·08** kg.

8-year-olds:
2.4G1: 1 ♂: 115 cm., 14·0 kg.

3.3G1: 5 ♀: cm.: 102, 103, 105, 108, 110. Av.: **105·6** cm.
kg.: 10·5, 11·5, 13·0, 13·5, 14·0. Av.: **12·5** kg.

Twice spawned: **1** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♀: 105 cm., 10·5 kg.

1939: **180** Ind.

2.1+: **4** ♀: cm.: 40, 42, 55, 56. Av.: **48·25** cm.
kg.: 1·0, 1·5, 2·0 (2). Av.: **1·63** kg.

3.1+: **7** Ind. (4 ♂, 3 ♀). cm.: 40, 43, 49 (♀), 50 (♀), 53 (♀), 55, 58. Av.: **49·7** (♂♂: 49·0, ♀♀: 50·67) cm.
kg.: 1·5 (5), 2·0 (2). Av.: **1·64** (♂♂: 1·62, ♀♀: 1·67) kg.

4.1+: **1** ♀: 57 cm., 2·0 kg.

3.2+: **61** Ind. (2 ♂, 59 ♀). cm.: 61, 70 (2), 71, 74 (5), 75 (2), 76 (3), 77 (3), 78 (4), 80 (5), 81 (5), 82 (5), 83 (2), 84 (4), 85 (8), 86 (4), 88, 89 (♂), 90 (3), 90 (♂), 91. Av.: **80·85** cm.
kg.: 3·5 (2), 4·0, 4·5 (8), 5·0 (7), 5·5 (8), 6·0 (11), 6·5 (7), 7·0 (5), 7·5 (5), 7·5 (♂), 8·0 (3), 8·0 (♂), 9·0 (2). Av.: **6·02** kg.

4.2+: **2** ♀: 76 and 80 cm., 4·5 and 5·0 kg.

2.3: **17** Ind. (7 ♂, 10 ♀). Av.: **102·18** (♂♂: 105·14, ♀♀: 100·10) cm., **12·76** (♂♂: 13·43, ♀♀: 12·30) kg.
cm.: 96, 97, 99 (2), 100 (3), 101, 102, 103, 104, 105 (2), 106 (2), 107 (2).
kg.: 11·5 (4), 12·0 (4), 12·5 (2), 13·0 (2), 13·5, 14·5 (3), 15·0.

3.3: **73** Ind. (13 ♂, 60 ♀). Av.: **99·25** (♂♂: 103·38, ♀♀: 98·35) cm., **10·84** (♂♂: 12·54, ♀♀: 10·48) kg.
cm.: 92 (2), 93 (3), 94 (4), 95 (8), 96 (3), 97 (7), 98 (6), 99 (5), 100 (7), 101 (7), 102 (6), 103 (2), 104 (5), 105 (5), 106, 110 (2).
kg.: 8·0 (3), 8·5 (6), 9·0 (6), 9·5 (6), 10·0 (9), 10·5 (5), 11·0 (12), 11·5 (7), 12·0 (2), 12·5 (4), 13·0 (5), 13·5 (5), 14·5 (2), 15·0.

3.4: **5** ♂: cm.: 113, 114, 115 (2), 116. Av.: **114·6** cm. —
kg.: 15·0 (2), 16·0 (2), 17·0. Av.: **15·8** kg.

3.5: **1** ♂: 120 cm., 18·0 kg.

Once spawned: **9** *Ind.*

7-year-olds:
3.1+G2: 1 ♀: 90 cm., 9·5 kg.

3.2+G1: 3 ♀: cm.: 92, 102 (2). — kg.: 9·0, 11·0 and 11·5.

8-year-olds:
3.3G1: 5 ♀: cm.: 98, 101, 106, 108, 115. Av.: **105·6** cm. —
kg.: 12·5 (2), 13·0, 14·0, 15·5. Av.: **13·5** kg.

1940: **257** Ind.

2.2+: **19** Ind. (1 ♂, 18 ♀) cm.: 69, 73, 74, 76 (2), 77 (2), 78, 79, 80, 82 (3), 83, 84 (2), 85, 87 (♂), 89. Av.: **79·84** cm.
kg.: 3·5, 4·0 (3), 4·5 (2), 5·5 (4), 6·5 (3), 7·0 (3), 7·5, 7·5 (♂), 8·0. Av.: **5·79** kg.

3.2+: **123** Ind. (7 ♂, 116 ♀). Av.: **78·67** (♂♂: 84·14, ♀♀: 78·34) cm., **5·45** (♂♂: 6·43, ♀♀: 5·39) kg.
cm.: 64, 69 (2), 70 (2), 72, 73 (6), 74 (5), 75 (13), 76 (17), 77, 78 (11), 79 (9), 80 (21), 81 (2), 82 (10), 83 (7), 84 (3), 85 (6), 87, 88 (2), 90 (2), 94.
kg.: 2·8, 3·0, 4·0 (10), 4·5 (16), 5·0 (30), 5·5 (24), 6·0 (22), 6·5 (8), 7·0 (3), 7·5 (2), 8·0 (4), 8·5, 10·0.

4.2+: **12** Ind. (1 ♂, 11 ♀). cm.: 60, 70, 75, 78 (3), 79, 80 (3), 82, 82 (♂). Av.: **76·83** cm.
kg.: 3·0, 4·0, 5·0 (6), 5·5 (2), 6·0, 6·0 (♂). Av.: **5·0** kg.

2.3: **7** Ind. (1 ♂, 6 ♀). cm.: 95, 97 (2), 99, 100, 104 (♂), 108. Av.: **100·0** cm.
kg.: 9·5, 11·0 (3), 11·5, 12·0, 14·5 (♂). Av.: **11·5** kg.

3.3: **73** Ind. (14 ♂, 59 ♀). Av.: **100·60** (♂♂: 104·93, ♀♀: 99·58) cm., **11·44** (♂♂: 12·54, ♀♀: 11·18) kg.
cm.: 85, 88, 90, 93 (2), 94 (3), 95 (6), 96 (3), 97 (2), 98 (4), 99 (2), 100 (15), 101 (2), 102 (3), 103 (5), 104 (8), 105 (3), 106 (2), 107, 108 (4), 109, 110 (3), 111.
kg.: 7·0, 8·0, 8·5 (4), 9·0 (3), 9·5 (4), 10·0 (6), 10·5 (4), 11·0 (2), 11·5 (11), 12·0 (5), 12·5 (4), 13·0 (6), 13·5 (3), 14·0 (3), 14·5 (2), 15·0 (3), 16·0.

3.4: **10** Ind. (♂ 9, 1 ♀). cm.: 110 (♀), 110, 111, 112, 113, 114, 116, 117, 119, 120. Av.: **114·2** cm.
kg.: 13·0, 14·0, 14·5, 15·0, 16·0, 16·5 (♀), 17·0 (3), 18·0. Av.: **15·8** kg.

3.5: 1 ♂: 119 cm., 14·0 kg.

Once spawned: **10** *Ind.*

5-year-olds:
2.1+G1: 1 ♀: 71 cm., 6·5 kg.

6-year-olds:
3.1+G1: 3 ♀: cm.: 75 (2), 92. — kg.: 5·0 (2), 9·0. — 1 ♂: 65 cm., 3·0 kg.

7-year-olds:
3.2+G1: 3 ♂: cm.: 86, 95 (2). kg.: 8·0, 9·5 and 10·0 kg. — 1 ♀: 90 cm., 7·0 kg.

3.3G+: 2 ♀: both 95 cm., 9·0 and 10·0 kg.

8-year-olds:
3.3G1: 1 ♀: 115 cm., 13·5 kg.

1941: **142** Ind.

2.2+: **1** ♀: 75 cm., 4·0 kg.
3.2+: **3** ♀: cm.: 73, 75 and 76; kg.: 4·0 and 5·0 (2).
4.2+: **1** ♀: 70 cm., 4·0 kg.

2.3: **9** ♀: cm.: 90, 92, 95 (2), 97, 99 (2), 100, 102. Av.: **96·56** cm. — kg.: 7·5 (2), 8·0, 10·0, 11·0 (2) 11·5 (2), 13·0. Av.: **10·11** kg.
3.3: **112** Ind. (23 ♂, 89 ♀). Av.: **96·96** (♂♂: 101·09, ♀♀: 95·89) cm., **10·18** (♂♂: 11·30. ♀♀: 9·89) kg.
cm.: 86 (2), 88 (2), 90 (6), 92 (12), 94 (9), 95 (15), 96 (8), 97 (7), 98 (14), 99 (2), 100 (10), 101 (4), 102 (5), 103 (6), 104 (4), 105 (5), 106.
kg.: 5·6, 6·0, 6·5, 7·0 (2), 7·5 (5), 8·0 (8), 8·5 (7), 9·0 (11), 9·5 (10), 10·0 (15), 10·5 (5), 11·0 (15), 11·5 (9), 12·0 (5), 12·5 (5), 13·0 (8), 13·5 (3), 15·5.
4.3: **1** ♀: 88 cm., 7·0 kg.

2.4: **3** ♂: cm.: 110, 114 and 118. Av.: **114·0** cm.
kg.: 15·0, 18·0, 21·5. Av.: **18·17** kg.
3.4: **8** Ind. (7 ♂, 1 ♀). cm.: 108 (♀), 108 (2), 109, 112 (2), 114, 118. Av.: **111·13** cm.
kg.: 12·5, 13·0, 14·5, 15·5, 16·0 (♂), 16·0, 16·5, 18·0. Av.: **15·25** kg.

Once spawned: **13** *Ind.*

6-year-olds:
3.1+G1: 2 ♂: 84 and 88 cm., 6·0 and 7·5 kg.

7-year-olds:
3.2+G1: **7** ♀: cm.: 92, 93, 96 (2), 97, 98, 99. Av.: **95·86**. — kg.: 8·0, 9·5, 10·0 (4), 10·5. Av.: **9·71** kg.

8-year-olds:
3.3G1: **4** Ind. (2 ♂, 2 ♀): cm.: 100 (♂), 102, 105 (♂), 105. Av.: **103·0** cm.; ♂♂: 12·0 and 15·0, ♀♀: 12·0 and 13·0 kg.

Twice spawned: **1** *Ind.*

10-year-olds:
3.3G1G1: 1 ♂: 107 cm., 15·5 kg.

1942: **166** Ind.

3.2+: **6** ♀: cm.: 60, 64, 71, 73, 76, 78. Av.: **70·33** cm.
kg.: 3·0, 4·0 (3), 4·5, 5·0. Av.: **4·08** kg.
4.2+: **2** ♀: 75 and 80 cm., 4·5 and 6·5 kg.

2.3: **13** Ind. (2 ♂, 11 ♀). cm.: 85 (♂), 85, 87, 88, 90 (4), 91, 95 (2), 95 (♂), 98. Av.: **90·69** (♀♀: 90·82) cm.
kg.: 6·5 (2), 7·0, 7·5 (3), 7·5 (♂), 9·0, 9·5, 10·0, 10·5 (♂), 10·5, 11·0. Av.: **8·5** (♀♀: 8·41) kg.
3.3: **117** Ind. (9 ♂, 108 ♀). Av.: **89·33** (♂♂: 99·67, ♀♀: 88·47) cm., **7·45** (♂♂: 10·56, ♀♀: 7·19) kg.
cm.: 80 (5), 81 (2), 82 (6), 83, 84 (5), 85 (12), 86 (5), 87 (2), 88 (10), 89 (7), 90 (26), 91 (7), 92, 93 (5), 94 (4), 95 (7), 96 (2), 97, 98 (2), 99 (2), 100 (2), 101, 104, 105.
kg.: 4·5, 5·0 (7), 5·5 (8), 6·0 (9), 6·5 (12), 7·0 (23), 7·5 (8), 8·0 (20), 8·5 (9), 9·0 (6), 9·5 (5), 10·0 (4), 10·5, 11·5 (3), 12·0.
4.3: **5** ♀: cm.: 80, 85, 90, 92 (2). Av.: **87·8** cm. — kg.: 6·5, 7·3, 8·0 (3). Av.: **7·56** kg.

2.4: **5** Ind. (4 ♂, 1 ♀). cm.: 105 (♀), 108, 109, 115 (2). Av.: **110·4** cm. — kg.: 12·0 (♀), 14·5 (2), 15·0, 15·5. Av.: **14·3** kg.
3.4: **6** Ind. (5 ♂, 1 ♀). cm.: 108, 111 (♀), 112, 114 (2), 117. Av.: **112·67** cm.
kg.: 14·5, 15·0 (2), 15·5, 15·5 (♀), 16·5. Av.: **15·33** kg.
4.4: **1** ♂: 120 cm., 18·0 kg.

Once spawned: **10** *Ind.*

6-year-olds:
2.2+G1: 3 ♀: cm.: 56, 91 and 97. — kg.: 3·0, 8·5, 11·0.

7-year-olds:
3.1+G2: 1 ♀: 100 cm., 11·5 kg.

3.2+G1: 2 ♀: 93 and 94 cm., 8·5 and 9·5 kg.

3.3G+: 2 ♀: 86 and 105 cm., 6·5 and 13·0 kg.

8-year-olds:
3.3G1: 2 ♂: 110 and 115 cm., both 14·5 kg. — 1 ♀: 107 cm., 13·0 kg.

1943: **253** Ind. (partly weighed).

3.2+: **4** ♀: 70 (2), 72, 73. Av.: **71·25** cm. — kg.: 4·0, 4·5 (3).

2.3: **15** Ind. (3 ♂, 12 ♀). cm.: 79, 80, 81 (2), 82, 86, 88 (♂), 90 (3), 91 (♂), 92 (2), 93, 98 (♂). Av.: **87·53** (♀♀: 86·33) cm.

3.3: **171** Ind. (6 ♂, 165 ♀). Av.: **86·77** (♂♂: 94·17, ♀♀: 86·50) cm., **6·66** kg. (2 ♂, 59 ♀).
cm.: 76, 77 (3), 78 (5), 79 (3), 80 (14), 81 (6), 82 (7), 83 (2), 84 (10), 85 (23), 86 (16), 87 (6), 88 (9), 89 (4), 90 (23), 91 (10), 92 (7), 93 (5), 94 (5), 95 (5), 97 (3), 98 (3), 104.
kg.: 5·0 (3), 5·5 (14), 6·0 (6), 6·5 (11), 7·0 (10), 7·0 (♂), 7·5 (7), 7·5 (♂), 8·0 (2), 8·5 (3), 9·0, 9·5, 10·0.

2.4: **11** Ind. (3 ♂, 8 ♀). cm.: 95, 96, 99, 100, 101 (♂), 102 (2), 102 (♂), 103, 115, 115 (♂). Av.: **102·73** (♀♀: 101·5) cm.

(not weighed).

3.4: **45** Ind. (15 ♂, 30 ♀). Av.: **103·27** (♂♂: 106·4, ♀♀: 101·7) cm., **11·21** (♂♂: 11·25, ♀♀: 11·20) kg. (4 ♂, 10 ♀).
cm.: 94, 95 (2), 97, 98 (2), 99 (2), 100 (5), 101 (5), 102 (5), 103, 104 (5), 105 (6), 107, 108, 109 (2), 110 (3), 112, 114, 115.
kg.: 8·5, 9·0, 9·0 (♂), 10·0, 10·5, 10·5 (♂), 11·0, 11·5 (2), 12·5, 12·5 (♂), 13·0 (♂), 13·5, 14·0.

Once spawned: **6** *Ind.*

6-year-olds:
2.1+G2: 1 ♀: 85 cm., 6·0 kg.

3.2+G+: 1 ♀: 82 cm.

7-year-olds:
3.1+G2: 1 ♂: 100 cm., 10·5 kg.

3.2+G1: 1 ♀: 88 cm., 7·0 kg.

2.3G1: 1 ♂: 115 cm., 1 ♀: 102 cm.

Twice spawned: **1** *Ind.*

8-year-olds:
2.2+G1G1: 1 ♂: 114 cm., 14·0 kg.

1944: **234** Ind. (not weighed).

2.1+: **2** Ind.: 47 and 60 cm.
3.1+: **4** Ind.: 45, 50, 55 and 59 cm.

2.2+: **10** Ind. (2 ♂, 8 ♀). Av.: **70·0** cm.
cm.: 63, 65, 66 (♂), 67, 70 (2), 73 (♂), 74 (2), 78.
3.2+: **33** Ind. (5 ♂, 28 ♀). Av.: **68·06** cm.
cm.: 60 (2), 62, 63, 63 (♂), 64 (2), 65 (3), 66, 67 (2), 68 (3), 68 (♂), 69 (3), 70 (4), 70 (2 ♂), 71 (2), 72 (2), 74, 78, 78 (♂).
4.2+: **4** ♀: 68, 70, 72 and 74 cm.

2.3: 1 ♂: 90 cm.
3.3: **50** Ind. (1 ♂, 49 ♀). Av.: **84·86** cm.
cm.: 73 (2), 74, 75, 76, 78, 78 (♂), 79 (2), 80 (4), 81, 82 (2), 83 (2), 84 (4), 85 (2), 86 (4), 87 (3), 88 (5), 90 (6), 91 (4), 92, 93 (2), 94.
4.3: **5** ♀: 80, 84, 89 and 95 (2) cm.

2.4: **19** Ind. (3 ♂, 16 ♀). Av.: **99·26** cm.
cm.: 93, 93 (♂), 94 (2), 95, 97 (2), 98 (2), 99, 100 (4), 102, 102 (♂), 104, 109 (♂), 111.

3.4: **102** Ind. (19 ♂, 83 ♀). Av.: **100·58** cm.
cm.: 91, 92 (2), 93 (2), 94 (6), 95 (7), 96 (10), 97 (5), 98 (6), 99 (3), 100 (17), 101 (3), 102 (5), 103 (3), 104 (10), 105 (6), 106 (2), 107 (2), 108 (2), 109 (4), 110 (3), 112, 113, 114.

Once spawned: **4** *Ind.*

7-year-olds:
2.3G1: 1 ♀: 110 cm.
3.3G+: 1 ♀: 89 cm.

8-year-olds:
3.3G1: 1 ♀: 100 cm., 1 ♂: 104 cm.

5. Alatornio, Pensaskari.

1943: **272** Ind. (not weighed).

3.1+: **1** ♀: 51 cm.

2.2+: **6** Ind. (1 ♂, 5 ♀). cm.: 69, 70, 71 (♂), 71, 72 (2). Av.: **71·0** (♀♀: 70·80) cm.
3.2+: **25** Ind. (4 ♂, 21 ♀). cm.: 59, 60 (2), 62, 63, 63 (♂), 65, 66 (4), 67 (2), 68, 69, 70 (2), 71, 71 (♂), 72 (♂), 74 (2), 76, 78, 78 (♂). Av.: **68·04** (♀♀: 67·48) cm.

2.3: **32** Ind. (3 ♂, 29 ♀). cm.: 81, 82, 83, 84 (6), 85 (2), 86 (7), 88, 89 (3), 92 (2), 92 (♂), 93 (2), 93 (♂), 94, 95 (2), 99 (♂). Av.: **87·97** (♂♂: 94·67, ♀♀: 87·28) cm.
3.3: **143** Ind. (16 ♂, 127 ♀). cm.: 78 (4), 79 (3), 80 (5), 81 (5), 82 (8), 83 (7), 84 (10), 85 (12), 86 (9), 87 (9), 88 (6), 89 (9), 90 (16), 91 (5), 92 (6), 93 (8), 94 (5), 95 (3), 96 (4), 97, 98 (3), 99 (2), 100 (2), 101. Av.: **87·81** (♂♂: 92·94, ♀♀: 87·17) cm.
4.3: **1** ♀: 94 cm.

2.4: **11** Ind. (4 ♂, 7 ♀). cm.: 100, 101, 103, 105 (3), 106, 106 (♂), 109 (2 ♂), 110 (♂). Av.: **105·36** (♀♀: 103·57) cm.
3.4: **38** Ind. (10 ♂, 28 ♀). cm.: 97 (3), 98 (5), 99 (4), 101 (5), 102, 103 (4), 104 (2), 105 (2), 106 (5), 108 (5), 113 (2). Av.: **102·89** (♂♂: 106·60, ♀♀: 101·57) cm.

Once spawned: **7** *Ind.*

6-year-olds:
2.3G+: 1 ♀: 103 cm.

7-year-olds:
3.2+G1: 3 ♀: 80, 90 and 98 cm. Av.: **89·3** cm.

3.3G+: 2 ♀: 100 and 104 cm., 1 ♂: 102 cm.

8-year-olds:
3.3G1: 1 ♂: 107 cm., 5 ♀: 102 (2), 105, 107 (2). Av.: **105·0** (♀♀: 104·6) cm.

Twice spawned: **2** *Ind.*

10-year-olds:
3.3G1G1: 2 ♂: 117 and 118 cm.

6. Ii (from the Sea).

1942: **86** Ind.

2.2+: **4** Ind. (2 ♂, 2 ♀). cm.: 60 (♂), 70 (1 ♂, 2 ♀). Av.: **67·5** cm. — kg.: 2·3 (♂), 3·5 (♂), 4·3, 5·5. Av.: **3·9** kg.

3.2+: **32** Ind. (14 ♂, 18 ♀). Av.: **67·5** (♂♂: 67·86, ♀♀: 67·22) cm., **3·55** (♂♂: 3·55, ♀♀: 3·56) kg.
cm: 60 (10), 65, 67, 68, 70 (15), 72, 78, 80 (2).
kg.: 2·0 (2), 2·3 (2), 2·5 (2), 2·8, 2·9, 3·0 (3), 3·2 (4), 3·3, 3·5 (3), 3·9 (2), 4·0 (3), 4·5 (2), 5·0 (6).

4.2+: **1** ♂: 70 cm., 5·0 kg.

2.3: **5** ♀: cm.: 87, 90 (4). — kg.: 6·0, 7·5, 8·5 (2), 9·0. Av.: **7·9** kg.

3.3: **40** Ind. (11 ♂, 29 ♀). Av.: **88·95** (♂♂: 90·64, ♀♀: 88·31) cm., **7·93** (♂♂: 8·18, ♀♀: 7·84) kg.
cm.: 80 (9), 85 (2), 87, 90 (21), 93, 98, 100 (5).
kg.: 3·3, 5·0, 5·5 (2), 5·6, 6·0, 6·5 (3), 7·0 (3), 7·5 (3), 7·9, 8·0 (7), 8·5 (7), 9·0 (2), 9·5 (2), 10·0 (2), 10·5 (3), 11·5.

2.4: **1** ♂: 110 cm., 18·0 kg. — 1 ♀: 110 cm., 17·0 kg.
3.4: **1** ♂: 110 cm., 16·0 kg. — 1 ♀: 110 cm., 15·0 kg.

1944: **69** Ind. (not weighed).

2.2+: **2** Ind. ♂: 70 cm., ♀: 74 cm.
3.2+: **7** Ind. (2 ♂, 5 ♀). cm.: 62, 63, 66 (♂), 67 (♂), 69, 70 (2). Av.: **66·71** (♂♂: 66·5, ♀♀: 66·8) cm.

2.3: **2** Ind. ♂: 87 cm., ♀: 88 cm.
3.3: **15** Ind. (2 ♂, 13 ♀). cm.: 76, 79, 80 (2), 81 (♂), 83 (2), 85 (3), 86 (2), 86 (♂), 90, 92. Av.: **83·8** (♀♀: 83·85) cm.

2.4: **4** Ind. (2 ♂, 2 ♀). cm.: 92 (♀), 97 (♀), 100 (2 ♂). Av.: **97·25** cm.
3.4: **39** Ind. (13 ♂, 26 ♀). Av.: **97·36** (♂♂: 102·0, ♀♀: 95·04) cm.
cm.: 88, 90 (3), 91 (2), 92 (4), 93, 94, 95 (5), 97 (2), 100 (10), 101, 102 (2), 103 (3), 104, 105 (3).

7. Simoniemi, Montaja.

1943: **325** Ind.

3.1+: **2** ♂: 44 and 53 cm., **2** ♀: 53 and 54 cm.
4.1+: **2** ♀: 52 and 56 cm.

2.2+: **2** ♂: 61 and 73 cm.
3.2+: **17** Ind. (2 ♂, 15 ♀). cm.: 60 (♂), 61, 62 (3), 64 (♂), 65 (2), 66, 67, 68, 70 (2), 71, 72, 73, 75. Av.: **66·65** (♀♀: 67·27) cm.

2.3: **14** Ind. (5 ♂, 9 ♀). cm.: 87 (3), 89, 90 (4), 91 (3), 92, 95, 96. Av.: **90·43** (♂♂: 92·40, ♀♀: 89·33) cm.
kg.: 6·0, 6·5, 7·5 (♂), 8·5 (♂), 9·5. Av.: **7·5** (♂♂: 7·75, ♀♀: 7·33) kg.

3.3: **239** Ind. (45 ♂, 194 ♀). Av.: **87·69** (♂♂: 92·02, ♀♀: 86·69) cm., **6·97** (♂♂: 7·69, ♀♀: 6·73) kg.
cm.: 74 (2), 75, 76 (4), 77 (2), 78 (6), 79 (2), 80 (16), 81 (5), 82 (8), 83 (6), 84 (10), 85 (21), 86 (12), 87 (20), 88 (17), 89 (16), 90 (20), 91 (13), 92 (12), 93 (7), 94 (9), 95 (10), 96 (6), 97 (4), 98 (3), 99 (2), 100 (4), 105.
kg.: 4·5 (3), 5·0 (4), 5·5 (9), 6·0 (15), 6·5 (10), 7·0 (18), 7·5 (4), 8·0 (12), 8·5 (5), 9·0 (4), 9·5, 10·0 (3), 10·5.
(Weighed 23 ♂, 67 ♀).

2.4: **10** Ind. (7 ♂, 3 ♀). cm.: 95, 96 (♀), 98, 98 (♀), 102 (♀), 106, 107, 108, 110, 112. Av.: **103·2** (♂♂: 105·14) cm.
kg.: 10·0, 12·5, 13·0 and 15·0 (all 4 ♂). Av.: **12·63** kg.

3.4: **28** Ind. (18 ♂, 10 ♀). Av.: **105·25** (♂♂: 107·44, ♀♀: 101·30) cm., **13·09** (♂♂: 13·31, ♀♀: 12·38) kg.
cm.: 95, 97, 99 (2), 100 (3), 101, 103, 104 (2), 105 (7), 107, 108, 110 (3), 111, 112, 113, 114, 115.
kg.: 10·0, 11·0, 12·0 (5), 12·5, 13·0 (3), 13·5, 14·5, 15·0, 16·0, 17·0. (Weighed 13 ♂, 4 ♀).

Once spawned: **2** *Ind.*

7-year-olds:
3.2+G1: 1 ♀: 92 cm., 8·5 kg.
8-year-olds:
3.3G1: 1 ♂: 108 cm., 13·0 kg.

8. Oulu River.

1936.

(a). Pyhäkoski: **1100** Ind.

2.1+: **8** Ind. Av.: **54·63** cm., **1·73** kg.
cm.: 49, 51 (2), 54 (2), 56, 60, 62.
kg.: 1·0 (2), 1·4, 1·9, 2·0 (3), 2·5.

3.1+: **63** Ind. Av.: **56·08** cm., **1·70** kg.
cm.: 43, 45, 48, 49 (2), 50 (6), 51 (5), 52 (2), 53 (6), 54 (2), 55 (6), 56 (3), 57 (3), 58 (6), 59 (2), 60 (5), 61 (2), 62 (2), 63 (2), 64, 65, 67, 69 (2), 70.
kg.: 0·7, 0·9 (2), 1·0 (6), 1·1, 1·2, 1·3 (2), 1·4 (2), 1·5 (13), 1·7 (9), 1·8 (3), 1·9 (2), 2·0 (12), 2·3 (3), 2·5 (4), 2·9, 3·0.

4.1+: **1** Ind. 54 cm., 1·5 kg.

2.2+: **28** Ind. (3 ♂, 25 ♀). Av.: **85·07** (♂♂: 87·67, ♀♀: 84·76) cm., **6·92** (♂♂: 7·33, ♀♀: 6·87) kg.
cm.: 74, 76 (2), 77, 79, 80, 81, 84 (4), 85 (3), 86, 87 (4), 88, 89 (2), 90 (4), 93, 95.
kg.: 5·2, 5·5 (4), 6·0 (3), 6·5 (6), 7·0 (3), 7·5 (4), 8·0 (4), 8·5, 9·0 (2).

3.2+: **79** Ind. (14 ♂, 65 ♀). Av.: **85·76** (♂♂: 86·21, ♀♀: 85·66) cm., **7·06** (♂♂: 6·97, ♀♀: 7·08) kg.
cm.: 72, 75, 78 (3), 80 (7), 81 (2), 82 (2), 83 (3), 84 (4), 85 (9), 86 (11), 87 (7), 88 (7), 89 (6), 90 (11), 91 (3), 94, 96.
kg.: 5·3, 5·4, 5·5, 5·7, 5·8 (2), 5·9 (2), 6·0 (9), 6·5 (12), 7·0 (18), 7·5 (12), 8·0 (12), 8·5 (7), 9·0.

4.2+: **8** Ind. (1 ♂, 7 ♀). cm.: 75, 85, 86, 89 (♂), 90 (2), 91, 95. Av.: **87·63** cm.
kg.: 6·0, 7·0 (2), 7·5 (♂), 7·5, 8·0, 8·5, 9·0. Av.: **7·56** kg.

2.3: **100** Ind. (9 ♂, 91 ♀). Av.: **103·49** (♂♂: 106·22, ♀♀: 103·22) cm., **12·37** (♂♂: 13·38, ♀♀: 12·26) kg.
cm.: 94 (2), 95 (2), 96 (2), 97 (3), 98 (2), 99 (3), 100 (17), 101 (3), 102 (12), 103 (5), 104 (10), 105 (10), 106 (3), 107 (4), 108 (6), 109 (6), 110 (4), 111 (2), 112, 113, 114 (2).
kg.: 9·0 (3), 9·5 (2), 10·0 (3), 10·5 (11), 11·0 (8), 11·5 (9), 12·0 (15), 12·5 (14), 13·0 (9), 13·5 (2), 14·0 (8), 14·5 (6), 15·0 (5), 15·5, 16·0 (2), 16·5 (2).

3.3: **573** Ind. (45 ♂, 528 ♀). Av.: **103·69** (♂♂: 106·82, ♀♀: 103·43) cm., **12·47** (♂♂: 13·52, ♀♀: 12·38) kg.
cm.: 87, 89, 90 (2), 91, 92 (5), 93 (2), 94 (7), 95 (24), 96 (6), 97 (10), 98 (7), 99 (7), 100 (92), 101 (29), 102 (31), 103 (28), 104 (35), 105 (97), 106 (27), 107 (34), 108 (23), 109 (22), 110 (60), 111 (10), 112 (4), 114, 115 (5), 116 (2).
kg.: 6·5, 7·5 (2), 8·0 (6), 8·5 (5), 9·0 (11), 9·5 (17), 10·0 (35), 10·5 (20), 11·0 (49), 11·5 (51), 12·0 (55), 12·5 (59), 13·0 (63), 13·5 (45), 14·0 (64), 14·5 (32), 15·0 (30), 15·5 (13), 16·0 (9), 16·5 (2), 17·0, 17·5, 18·5, 19·0.

4.3: **24** Ind. (2 ♂, 22 ♀). Av.: **105·42** (♀♀: 105·0) cm., **12·98** (♀♀: 12·84) kg.
cm.: 99, 100 (2), 102, 103, 104 (2), 105 (8), 106, 107, 109, 110 (2), 110 (2 ♂), 114.
kg.: 9·5, 11·0 (2), 11·5, 12·0 (4), 12·5 (4), 13·0, 13·5 (2), 14·0 (2), 14·0 (♂), 14·5 (3), 15·0 (2), 15·0 (♂).

2.4: **24** Ind. (11 ♂, 13 ♀). Av.: **116·21** (♂♂: 119·45, ♀♀: 113·46) cm., **17·46** (♂♂: 18·68, ♀♀: 16·42) kg.
cm.: 108, 109, 110 (3), 111, 115 (5), 116 (3), 117 (2), 118, 120 (3), 123, 124 (2), 125.
kg.: 13·0, 13·5, 14·0 (2), 15·0, 15·5, 16·0 (4), 16·5 (2), 17·5 (2), 18·0, 18·5, 19·0, 19·5 (2), 20·5, 21·0 (2), 22·5 (2).

3.4: **139** Ind. (58 ♂, 81 ♀). Av.: **115·06** (♂♂: 116·59, ♀♀: 113·98) cm., **16·50** (♂♂: 16·69, ♀♀: 16·36) kg.
cm.: 107, 109 (3), 110 (16), 111 (7), 112 (7), 113 (10), 114 (8), 115 (35), 116 (11), 117 (9), 118 (8), 119 (6), 120 (10), 121 (3), 123, 124, 125 (3).
kg.: 13·0, 13·5 (2), 14·0 (8), 14·5 (8), 15·0 (14), 15·5 (11), 16·0 (23), 16·5 (14), 17·0 (19), 17·5 (4), 18·0 (14), 18·5 (9), 19·0 (3), 19·5 (6), 20·0 (3).

4.4: **4** ♀: cm.: 110 (2), 114, 119. Av.: **113·25** cm.
kg.: 13·5, 14·5, 16·0, 19·5. Av.: **15·88** kg.

3.5: **7** Ind. (5 ♂, 2 ♀). cm.: 119 (♀), 120, 121 (♀), 124, 125, 127, 130. Av.: **123·7** (♂♂: 125·2) cm.
kg.: 18·0 (♀), 20·0, 20·5 (♀), 20·5, 22·0, 23·0, 24·0. Av.: **21·14** (♂♂: 21·90) kg.

Once spawned: **38** *Ind.*

5-year-olds:
3.1+G+: **4** ♂: cm.: 65, 68, 69, 70. — kg.: 3·0 (2), 3·5, 4·0.

6-year-olds:
3.1+G1+: **6** Ind. (3 ♂, 3 ♀). cm.: 86 (♀), 87, 89 (♀), 90, 92 (♀), 94. Av.: **89·5** cm.
kg.: 7·0 (2 ♂), 8·0, 8·5 (♂), 8·5, 9·0. Av.: **8·0** kg.

2.2+G1: 1 ♀: 98 cm., 12·0 kg.

4.1+G+: 1 ♀: 69 cm., 4·0 kg.

7-year-olds:
3.1+G2: **6** Ind. (4 ♂, 2 ♀). cm.: 100, 101, 106 (♀), 110, 115 (♀), 119. Av.: **108·5** cm.
kg.: 11·0, 12·0, 13·0 (2 ♀), 15·0, 19·0. Av.: **13·83** (♂♂: 14·25) kg.

3.3G+: 1 ♀: 112 cm., 13·5 kg.
3.3G[1]): 1 ♀: 85 cm., 5·5 kg.

8-year-olds:
4.1+G2: 1 ♂: 107 cm., 13·5 kg.

3.2+G2: 1 ♂: 129 cm., 16·0 kg.

3.3G1: **11** Ind. (1 ♂, 10 ♀). cm.: 100, 102, 110 (4), 111, 112, 113, 115, 115 (♂). Av.: **109·8** cm.
kg.: 12·5, 13·0 (2), 13·5, 14·5, 15·0 (2), 15·0 (♂), 15·5, 16·0, 16·5. Av.: **14·5** kg.

3.4G+: 1 ♀: 115 cm., 14·0 kg.

9-year-olds:
3.4G1: 2 ♂: 117 and 118 cm., 17·0 and 18·0 kg. — 1 ♀: 119 cm., 19·5 kg.

4.3G1: 1 ♀: 100 cm., 11·5 kg.

Twice spawned: **4** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♀: 111 cm., 15·0 kg.

3.3G1G[1]): 1 ♀: 115 cm., 9·0 kg.

10-year-olds:
3.3G1G1: 2 ♀: 110 and 115 cm., both 14·0 kg.

(b) Maijala and Varvikko[2]): **362** Ind.

2.2+: **6** Ind. (2 ♂, 4 ♀). cm.: 78 (♂), 83 (♂), 84, 87, 90, 91. Av.: **85·5** (♀♀: 88·0) cm.
kg.: 6·0 (♂), 6·5 (2), 7·5 (♂), 7·5, 8·0. Av.: **7·08** (♀♀: 7·25) kg.

3.2+: **15** ♀: cm.: 80, 83, 85, 86, 87, 88 (2), 89 (4), 90, 91, 98 (2), 99. Av.: **89·31** cm.
kg.: 5·0, 6·0, 6·5 (3), 7·0 (2), 7·5 (5), 8·0 (2), 9·0 (2). Av.: **7·25** kg.

4.2+: **1** ♀: 90 cm., 7·5 kg.

2.3+: **47** Ind. (2 ♂, 45 ♀). Av.: **105·74** (♀♀: 105·51) cm., **13·06** (♀♀: 12·99) kg.
cm.: 92, 98, 99, 100 (4), 101 (2), 102 (3), 103 (4), 105 (4), 106 (3), 107 (5), 108 (5), 109 (4), 109 (♂), 110 (4), 111, 112 (2), 113 (♂), 115.
kg.: 9·0, 9·5, 10·0 (2), 10·5 (3), 11·0, 11·5 (5), 12·0 (3), 12·5 (2), 13·0 (7), 13·5 (4), 13·5 (♂), 14·0, 14·5 (7), 15·0 (6), 16·0 (♂), 17·0, 17·5.

3.3: **181** Ind. (24 ♂, 157 ♀). Av.: **104·72** (♂♂: 108·46, ♀♀: 104·15) cm., **12·77** (♂♂: 14·12, ♀♀: 12·57) kg.
cm.: 92 (2), 93, 94, 95, 96 (2), 97 (2), 98 (6), 99, 100 (20), 101 (5), 102 (13), 103 (18), 104 (9), 105 (25), 106 (7), 107 (16), 108 (18), 109 (6), 110 (14), 111 (4), 112 (4), 113 (2), 114, 115 (3).
kg.: 8·5 (2), 9·0 (3), 9·5, 10·0 (11), 10·5 (5), 11·0 (12), 11·5 (15), 12·0 (32), 12·5 (7), 13·0 (23), 13·5 (17), 14·0 (17), 14·5 (13), 15·0 (5), 15·5 (6), 16·0 (6), 16·5 (3), 17·0 (2), 17·5.

[1]) "Kelt". [2]) Netting grounds.

4.3: **12** Ind. (1 ♂, 11 ♀). cm.: 97, 100, 105 (3), 106 (2), 107 (2), 108, 113, 114 (♂). Av.: **106·08** (♀♀: 105·36) cm.
kg.: 10·5, 11·5, 12·0, 13·0 (3), 13·5 (2), 14·0, 14·5, 15·0, 16·5 (♂). Av.: **13·33** (♀♀: 13·05) kg.

2.4: **14** Ind. (7 ♂, 7 ♀). Av.: **118·57** (♂♂: 121·0, ♀♀: 116·14) cm., **18·18** (♂♂: 19·07, ♀♀: 17·29) kg.
cm.: 112 (2), 115, 116, 118 (5), 120, 121, 122, 125, 127.
kg.: 14·5 (2), 17·0, 17·5, 18·0 (3), 18·5 (2), 19·0 (2), 19·5 (2), 23·0.

3.4: **33** Ind. (12 ♂, 21 ♀). Av.: **114·27** (♂♂: 115·83, ♀♀: 113·38) cm., **16·67** (♂♂: 16·91, ♀♀: 16·33) kg.
cm.: 109, 110 (5), 111, 112 (3), 113 (5), 114 (3), 115 (6), 116, 117 (4), 120 (2), 122 (2).
kg.: 12·0, 13·5, 14·5, 15·0 (3), 15·5 (3), 16·0 (5), 16·5 (4), 17·0 (5), 17·5 (4), 18·0 (2), 19·5, 20·0, 21·0 (2).

4.4: **3** ♂: cm.: 115, 120 (2). — kg.: 16·0, 18·0, 20·5. Av.: **18·17** kg.

2.5: **2** ♂: 122 and 131 cm., 19·5 and 22·5 kg.

3.5: **9** Ind. (8 ♂, 1 ♀). cm.: 120 (♀), 124 (2), 125 (2), 126, 127, 130, 137. Av.: **126·44** (♂♂: 127·25) cm.
kg.: 14·5, 17·0 (♀), 18·5, 19·0, 21·0, 22·5, 23·0 (2), 23·5. Av.: **20·22** (♂♂: 20·63) kg.

Once spawned: **34** *Ind.*

6-year-olds:

2.1+G2: 1 ♂: 110 cm., 14·0 kg.

3.1+G1: 1 ♂: 90 cm., 8·0 kg. — 2 ♀: 83 and 93 cm., 6·5 and 9·5 kg.

7-year-olds:

3.1+G2: 5 ♂: cm.: 102, 104, 107, 111 (2). Av.: **107·0** cm. — kg.: 12·5, 13·5, 14·0, 14·5, 16·5. Av.: **14·2** kg. — 1 ♀: 115 cm., 13·0 kg.

2.3G1: 1 ♀: 116 cm., 14·5 kg.

3·2+G1: 1 ♀: 100 cm., 11·5 kg.

3.3G+: 3 ♀: 100, 103 and 110 cm., 10·0, 11·0 and 14·0 kg.

8-year-olds:

3.2+G2: 1 ♀: 115 cm., 15·0 kg.

2.4G1: 1 ♀: 119 cm., 19·0 kg.

3.3G1: 1 ♂: 110 cm., 14·5 kg. — 14 ♀: cm.: 104, 105 (3), 106, 107, 108, 109, 110 (2), 112 (2), 114 (2), 115. Av.: **109·0** cm. — kg.: 11·5, 12·0, 12·5, 13·0 (2), 13·5 (2), 14·0 (4), 14·5 (2), 16·5. Av.: **13·61** kg.

9-year-olds:

3·4G1: 1 ♂: 125 cm., 22·0 kg. — 4 ♀: cm.: 114, 118, 126, 129. Av.: **121·75** cm.
kg.: 15·0, 18·0, 20·0, 20·5. Av.: **18·38** kg.

Twice spawned: **1** *Ind.*

10-year-olds:

3.3G1G1: 1 ♀: 120 cm., 17·0 kg.

1937.

(a) Pyhäkoski: **426** Ind.

2.1+: **2** Ind. 58 and 60 cm., 2·0 and 2·6 kg.

3.1+: **15** Ind. cm.: 43, 53, 54, 57, 60 (2), 61 (2), 62, 63, 64 (2), 65, 66, 68. Av.: **60·07** cm.
kg.: 1·5 (2), 2·0 (2), 2·2, 2·3, 2·4, 2·5 (6), 3·0 (2). Av.: **2·32** kg.

4.1+: **3** Ind. 58, 60 and 62 cm., 2·0 (2), 2·6 kg.

2.2+: **3** ♀: 78, 86 and 89 cm., 6·0, 7·0 and 8·0 kg.

3.2+: **22** Ind. (3 ♂, 19 ♀). Av.: **84·68** (♀♀: 84·11) cm., **7·15** (♀♀: 7·06) kg.
cm.: 71, 74, 75, 78, 79, 81, 82 (♂), 83 (3), 84, 87 (3), 90 (2), 90 (♂), 91, 92, 93, 93 (♂).
kg.: 5·4, 5·7 (2), 6·0, 6·5 (3), 6·7 (♂), 7·0 (4), 7·5 (4), 7·8, 8·0 (♂), 8·5 (2), 8·5 (♂), 9·0.

4.2+: **1** ♀: 83 cm., 7·0 kg.

2.3: **41** Ind. (2 ♂, 39 ♀). Av.: **103·85** (♀♀: 103·69) cm., **12·88** (♀♀: 12·73) kg.
cm.: 86, 90, 91, 96, 99 (2), 100 (5), 101 (2), 102 (3), 103, 104, 105 (4), 106 (3), 107 (5), 108, 109 (4), 110 (3), 111, 112 (2).
kg.: 8·5, 9·0 (2), 10·0, 10·5, 11·0 (2), 11·5 (4), 12·0 (4), 12·5 (4), 13·0 (4), 13·6 (4), 14·0 (2), 14·5 (3), 15·0 (6), 15·5 (2), 16·5.

3.3: **174** Ind. (12 ♂, 162 ♀). Av.: **103·46** (♂♂: 111·17, ♀♀: 102·89) cm., **12·28** (♂♂: 14·78, ♀♀: 12·09) kg.
cm.: 90 (2), 91, 92 (2), 93, 95 (4), 96 (4), 97 (3), 98 (3), 99 (5), 100 (28), 101 (6), 102 (26), 103 (10), 104 (8), 105 (19), 106 (10), 107 (8), 108 (5), 109 (3), 110 (9), 111 (3), 112 (6), 113 (2), 114 (2), 115 (3), 118,
kg.: 8·0, 8·5 (2), 9·0 (3), 9·5 (2), 10·0 (11), 10·5 (8), 11·0 (19), 11·5 (20), 12·0 (27), 12·5 (20), 13·0 (17), 13·5 (12), 14·0 (11), 14·5 (8), 15·0, 15·5 (8), 16·5 (2), 17·0 (2).

4.3: **37** Ind. (5 ♂, 32 ♀). Av.: **104·38** (♂♂: 107·80, ♀♀: 103·84) cm., **11·84** (♂♂: 13·0, ♀♀: 11·66) kg.
cm.: 95 (2), 96, 100 (8), 101 (2), 102 (3), 103 (3), 105 (5), 106 (2), 107, 109, 110 (3), 112 (4), 114 (2).
kg.: 9·0 (2), 10·0 (4), 10·5 (4), 11·0 (2), 11·5 (4), 12·0 (8), 12·5 (3), 13·0 (4), 13·5, 14·0 (3), 14·5.

5.3: **1** ♀: 112 cm., 17·0 kg.

2.4: **11** Ind. (7 ♂, 4 ♀). Av.: **115·64** (♂♂: 116·57, ♀♀: 114·0) cm., **17·36** (♂♂: 18·14, ♀♀: 16·0) kg.
cm.: 110 (3), 114 (2), 116 (2), 118, 120, 121, 123.
kg.: 14·5, 15·0, 15·5, 16·0, 17·0 (2), 17·5 (3), 19·0, 24·5.

3.4: **70** Ind. (18 ♂, 52 ♀). Av.: **114·93** (♂♂: 116·28, ♀♀: 114·46) cm., **16·72** (♂♂: 17·50, ♀♀: 16·45) kg.
cm.: 108, 110 (7), 111, 112 (8), 113 (7), 114 (6), 115 (15), 116 (5), 117 (6), 118 (5), 119 (2), 120 (3), 121 (2), 122, 126.
kg.: 12·5 (2), 14·0, 14·5 (3), 15·0 (5), 15·5 (8), 16·0 (10), 16·5 (7), 17·0 (11), 17·5 (6), 18·0 (5), 18·5 (5), 19·0 (3), 19·5, 20·0 (2), 22·5.

4.4: **1** ♂: 125 cm., 22·5 kg.

2.5: **1** ♂: 120 cm., 20·5 kg.

3.5: **13** Ind. (9 ♂, 4 ♀): cm.: 120 (2 ♀), 120 (2), 121 (2), 122 (2), 124 (♀), 125, 125 (♀), 126, 127. Av.: **122·54** (♂♂: 122·67). cm.
kg.: 18·0 (♀), 18·0, 18·5 (2), 19·0 (2 ♀), 19·0, 21·0, 21·5 (2), 22·5, 22·8 (♀), 28·5. Av.: **20·60** (♂♂: 21·0) kg.

4.5: **1** ♂: 122 cm., 19·0 kg.

3.6: **1** ♂: 130 cm., 26·5 kg.

Once spawned: **29** *Ind.*

6-year-olds:
3.1+G1: 3 ♂: 88, 91 and 92 cm., 8·0 (2) and 8·5 kg.

2.2+G1: 1 ♀: 101 cm., 13·5 kg.

7-year-olds:
3.1+G2: 3 ♂: 107, 114 and 115 cm., 13·5, 14·0 and 17·5 kg.
4.1+G1: 1 ♀: 90 cm., 8·0 kg.

3.2+G1: **7** ♀: cm.: 90, 100 (2), 102, 104, 105, 110. Av.: **101·57** cm. — kg.: 10·0 (2), 11·0, 11·5, 12·0, 13·7, 14·0. Av.: **11·74** kg.

2.3G1: 2 ♀: both 114 cm., 14·5 and 15·0 kg.

8-year-olds:
4.1+G2: 1 ♂: 102 cm., 12·5 kg. — 1 ♀: 101 cm., 12·0 kg.

3.3G1: **10** ♀: cm.: 102, 103, 104 (2), 108 (2), 111, 112, 115 (2). Av.: **108·20** cm.
kg.: 12·0, 13·5 (3), 14·0, 15·0 (2), 17·0 (2), 17·5. Av.: **14·80** kg.

(b). Maijala and Varvikko: **91** Ind.

2.2+: **3** ♀: 84, 85 and 86 cm., 6·0 and 6·5 (2) kg.
3.2+: **6** ♀: cm.: 74, 83, 84, 85 (2), 94. Av.: **84·17** cm.
kg.: 5·5, 6·0, 6·3, 6·5 (3). Av.: **6·22** kg.

2.3: **10** ♀: cm.: 100 (2), 101, 102, 103 (3), 105 (2), 107. Av.: **102·9** cm.
kg.: 9·5, 10·0, 10·5, 11·0 (3), 11·5, 12·5 (2), 14·0. Av.: **11·35** kg.

3.3: **42** Ind. (2 ♂, 40 ♀). Av.: **104·36** (♀♀: 103·9) cm., **11·96** (♀♀: 11·78) kg.
cm.: 95 (3), 97, 98, 100 (2), 101 (3), 102 (5), 103 (2), 104 (3), 105 (7), 106 (5), 107, 108, 109 (2), 110 (2), 112, 112 (♂), 115, 115 (♂).
kg.: 8·0, 8·5, 9·0, 9·5, 10·0 (4), 10·5 (2), 11·0 (6), 11·5 (3), 12·0 (7), 12·5 (3), 13·0 (5), 13·5 (2), 14·0, 14·5, 15·5, 15·5 (♂), 16·0 (♂), 17·0.

4.3: **5** ♀: cm.: 99, 104, 105 (2), 106. Av.: **103·8** cm.
kg.: 10·0, 11·0, 12·0 (2), 13·0. Av.: **11·6** kg.

2.4: **2** ♂: 118 and 123 cm., 16·0 and 18·5 kg. — 1 ♀: 120 cm., 14·5 kg.

3.4: **8** Ind. (4 ♂, 4 ♀): cm.: 108, 114, 116 (♀), 118 (♀), 119, 120, 121 (♀), 125 (♀). Av.: **117·03** (♂♂: 115·25, ♀♀: 120·0) cm.
kg.: 14·0, 14·5, 16·0, 17·0 (2 ♀), 20·0 (2 ♀), 20·5. Av.: **17·38** (♂♂: 16·25, ♀♀: 18·50) kg.

2.5: **4** ♂: cm.: 124, 125, 129 and 132. — kg.: 21·0 (2), 21·5 and 24·0 kg.

3.5: **2** ♂: 123 and 137 cm., 19·0 and 20·0 kg.

Once spawned: **7** *Ind.*

7-year-olds:
3.2+G1: 1 ♂: 104 cm., 11·5 kg. — 1 ♀: 106 cm., 13·5 kg.

8-year-olds:
3.3G1: 4 ♀: cm.: 108, 109, 116, 119. Av.: **113·0** cm.
kg.: 12·5, 13·0, 14·0 (2). Av.: **13·38** kg.

9-year-olds:
3.4G1: 1 ♀: 114 cm., 14·5 kg.

Twice spawned: **1** *Ind.*

9-year-olds:
2.3G1G1: 1 ♀: 124 cm., 17·5 kg.

1938.

(a) Pyhäkoski: **492** Ind.

2.1+: **20** Ind. Av.: **56·05** cm., **2·23** kg.
cm.: 45 (2), 50 (5), 54, 55 (3), 60 (4), 63 (2), 64, 65,67.
kg.: 1·3, 1·5 (3), 2·0 (5), 2·3, 2·5 (8), 3·0, 3·5.

3.1+: **114** Ind. Av.: **58·19** cm., **2·52** kg.
cm.: 40, 41 (2), 42, 44, 45 (6), 46, 48 (2), 49, 50 (12), 52, 53, 54, 55 (8), 56 (2), 57 (2), 58 (2), 59 (3), 60 (21), 61 (8), 62 (5), 63 (3), 64 (4), 65 (13), 67 (4), 68, 69 (2), 70 (5), 75.
kg.: 1·0 (2), 1·5 (9), 2·0 (28), 2·5 (40), 3·0 (26), 3·5 (10), 4·0 (3).

4.1+: **15** Ind. Av.: **59·93** cm., **2·77** kg.
cm.: 40, 45, 50, 55, 56, 60 (2), 65 (5), 67 (2), 74.
kg.: 1·5 (2), 2·0, 2·5 (3), 3·0 (5), 3·5 (4).

2.2+: **12** Ind. (2 ♂, 10 ♀). cm.: 60 (♂), 80 (♂), 80, 81, 83, 84, 85 (2), 88, 89, 90 (2). Av.: **82·92** (♀♀: 85·5) cm.
kg.: 3·0 (♂), 5·5, 6·0, 6·5, 7·0 (3), 7·5, 7·5 (♂), 8·0 (2), 8·5. Av.: **6·79** (♀♀: 7·10) kg.

3.2+: **60** Ind. (10 ♂, 50 ♀). Av.: **78·07** (♂♂: 78·5, ♀♀: 77·98) cm., **6·94** (♂♂: 6·53, ♀♀: 7·02) kg.
cm.: 55, 60 (3), 64, 65 (4), 70 (12), 71, 72, 76 (2), 77, 79, 80 (5), 81, 82, 83 (2), 85 (12), 86, 90 (9), 94, 95.
kg.: 3·8, 4·2, 4·5, 5·0, 5·5 (4), 5·7, 6·0 (6), 6·5 (14), 7·0 (5), 7·5 (8), 8·0 (12), 8·5 (3), 9·0 (2), 9·5.

4.2+: **13** ♀: cm.: 70, 75, 77, 80, 81, 85 (3), 88, 90 (2), 91, 92. Av.: **83·77** cm.
kg.: 7·0 (5), 7·5 (3), 8·0, 8·5 (2), 9·0, 9·5. Av.: **7·77** kg.

2.3: **21** Ind. (3 ♂, 18 ♀). Av.: **103·48** (♀♀: 103·06) cm., **12·36** (♀♀: 12·08) kg.
cm.: 99, 100 (3), 101 (4), 102, 103 (3), 103 (♂), 105 (2), 105 (♂), 106, 107, 108, 110, 110 (♂).
kg.: 10·0, 10·5 (3), 11·0, 12·0 (5), 12·5 (4), 13·0, 13·0 (♂), 13·5, 14·0, 14·0 (♂), 14·5, 15·0 (♂).

3.3: **120** Ind. (11 ♂, 109 ♀). Av.: **102·53** (♂♂: 100·82, ♀♀: 102·70) cm., **11·95** (♂♂: 11·82, ♀♀: 11·97) kg.
cm.: 90 (4), 91, 94, 95 (6), 97 (2), 98 (2), 100 (17), 101 (19), 102 (16), 103 (7), 104 (9), 105 (11), 106 (4), 107, 108 (2), 109 (2), 110 (10), 111 (4), 113 (2).
kg.: 6·5, 8·0, 8·5, 9·0 (4), 9·5 (5), 10·0 (8), 10·5 (5),

11·0 (15), 11·5 (12), 12·0 (13), 12·5 (12), 13·0 (13), 13·5 (14), 14·0 (9), 14·5 (5), 15·0 (2).

4.3: **7** ♀: cm.: 99, 101, 102 (2), 106 (2), 111. Av.: **103·86** cm.
kg.: 7·0, 10·5, 11·5, 12·5, 13·0, 14·5, 18·0. Av.: **12·43** kg.

2.4: **7** Ind. (1 ♂, 6 ♀). cm.: 110, 113 (2), 117, 118 (2), 123 (♂). Av.: **116·0** (♀♀: 114·83) cm.
kg.: 12·5, 15·5 (2), 17·0, 17·5 (♂), 18·0 (2). Av.: **16·29** (♀♀: 16·08) kg.

3.4: **55** Ind. (13 ♂, 42 ♀). Av.: **115·18** (♂♂: 116·62, ♀♀: 114·74) cm., **16·56** (♂♂: 17·46, ♀♀: 16·29) kg.
cm.: 110 (7), 111 (6), 112 (3), 113 (6), 114 (3), 115 (6), 116 (6), 117 (3), 118 (2), 119 (4), 120 (3), 121 (3), 123 (2), 125.
kg.: 12·5, 13·0, 13·5, 14·0 (2), 14·5 (6), 15·0 (7), 15·5 (3), 16·0 (4), 16·5 (3), 17·0 (8), 17·5 (3), 18·0 (3), 18·5 (2), 19·0 (7), 19·5 (2), 20·0, 20·5.

2.5: **2** ♀: 119 and 122 cm., 19·0 and 22·5 kg.

3.5: **9** Ind. (5 ♂, 4 ♀). Av.: **123·56** (♂♂: 124·2, ♀♀: 122·75) cm., **19·61** (♂♂: 19·2, ♀♀: 20·13) kg.
cm.: 120 (2), 121 (2), 123 (2), 125, 127, 132.
kg.: 16·5, 17·5, 18·0, 19·5, 20·0 (2), 20·5, 22·0, 22·5.

Once spawned: **31** *Ind.*

4-year-olds:
2.1+G+: 2 ♂: 60 and 85 cm., 4·5 and 7·5 kg.

6-year-olds:
3.1+G1: 1 ♂: 100 cm., 9·5 kg. — 1 ♀: 90 cm., 8·0 kg.

2.2G1: 1 ♂: 100 cm., 11·5 kg.

7-year-olds:
3.1+G2: 4 ♂: 85, 103, 105, 110 cm. Av.: **100·75** cm. — 7·0, 15·0 (2), 16·0 kg. Av.: **13·25** kg. — 3 ♀: 90, 102, 105 cm. — 8·0, 13·0, 14·5 kg.

3.2+G1: 1 ♀: 85 cm., 7·0 kg.

8-year-olds:
3.2+G2: 1 ♀: 105 cm., 14·5 kg.

3.3G1: 1 ♂: 106 cm., 13·5 kg. — 14 ♀: cm.: 100, 102 (2), 103, 105 (2), 108, 109 (2), 110 (3), 112, 115. Av.: **107·14** cm.
kg.: 9·5, 12·5, 13·0 (3), 13·5, 14·0, 15·0 (4), 15·5, 16·5 (2). Av.: **14·07** kg.

2.4G1: 1 ♀: 118 cm., 18·0 kg.

9-year-olds:
4.3G1: 1 ♀: 114 cm., 14·0 kg.

3.4G1: 3 ♀: 113 and 118 (2) cm., 15·0, 15·5, 16·2 kg.

Twice spawned: **3** *Ind.*

10-year-olds:
3.3G1G1: 3 ♀: 110, 112, 113 cm., 11·5, 15·0, 15·5 kg.

(b) Maijala: **109** Ind.

2.1+: **9** Ind. cm.: 54, 60 (2), 64, 65 (2), 67 (2), 71. Av.: **63·67** cm.
kg.: 2·0 (2), 2·5 (2), 2·8, 3·0 (3), 3·5. Av.: **2·71** kg.

3.1+: **24** Ind. Av.: **65·04** cm., **2·7** kg.
cm.: 60 (2), 61 (2), 63 (2), 64, 65 (7), 66 (4), 67 (2), 68 (2), 70 (2).
kg.: 2·0 (3), 2·5 (10), 2·7, 3·0 (8), 3·5 (2).

4.1+: **1** Ind. 65 cm., 2·5 kg.

2.2+: **5** ♀: cm.: 80, 85, 86, 87 and 90. Av.: **85·6** cm.
kg.: 5·0 (2), 6·0, 6·5, 7·5. Av.: **6·0** kg.

3.2+: **1** ♂: 86 cm., 6·0 kg. — 15 ♀: cm.: 78, 82, 87 (3), 88, 90 (5), 91 (2), 92, 93. Av.: **88·4** cm.
kg.: 6·0, 6·5 (2), 7·0 (2), 7·5 (2), 8·0 (5), 8·5 (2), 9·0. Av.: **7·5** kg.

2.3: **2** ♂: 101 and 102 cm., 10·5 and 11·0 kg.

3.3: **35** Ind. (4 ♂, 31 ♀). Av.: **104·69** (♀♀: 104·94) cm., **12·04** (♀♀: 12·26) kg.
cm.: 95, 97, 98, 99 (♂), 100, 100 (♂), 101 (3), 102, 103 (4), 104, 105 (3), 105 (♂), 106 (2), 107 (4), 107 (♂), 108 (4), 109 (2), 110, 113, 114.
kg.: 8·5, 9·0, 9·0 (2 ♂), 9·5, 10·0 (2), 10·0 (♂), 10·5, 11·0 (2), 12·0 (4), 12·5 (6), 13·0 (4), 13·5 (4), 13·5 (♂), 14·0 (3), 14·5, 15·0.

3.4: **7** Ind. (2 ♂, 5 ♀). cm.: 112, 115 (2), 116, 118, 119 (♂), 126 (♂). Av.: **117·29** (♀♀: 115·2) cm.
kg.: 15·0 (2), 15·5 (♂), 16·0, 17·0, 17·0 (♂), 18·0. Av.: **16·21** (♀♀: 16·2) kg.

3.5: 1 ♂: 125 cm., 19·5 kg.

Once spawned: **7** *Ind.*

5-year-olds:
3.1+G+: 2 Ind. both 72 cm. and 3·5 kg.

7-year-olds:
3.1+G2: 1 ♂: 111 cm., 14·0 kg.

3.2+G1: 1 ♀: 102 cm., 11·0 kg.

2.3G1: 1 ♀: 115 cm., 15·5 kg.

8-year-olds:
3.3G1: 2 ♀: 111 and 116 cm., 15·0 and 16·0 kg.

Twice spawned: **2** *Ind.*

9-year-olds:
3.2+G1G1: 1 ♀: 113 cm., 14·0 kg.

10-year-olds:
3.3G1G1: 1 ♀: 113 cm., 16·0 kg.

1939:

(a) Pyhäkoski: **385** Ind.

2.1+: **10** Ind. Av.: **54·4** cm., **1·9** kg.
cm.: 41, 48, 50, 56, 57 (2), 58 (2), 59, 60.
kg.: 1·0, 1·5, 2·0 (7), 2·5.

3.1+: **124** Ind. Av.: **56·07** cm., **2·07** kg.
cm.: 45 (2), 46 (2), 47, 48 (4), 49 (4), 50 (17), 51 (2), 52 (2), 53 (2), 54 (2), 55 (21), 56 (2), 57 (6), 58 (9), 59, 60 (29), 61 (4), 62 (4), 63 (4), 65 (5), 67.
kg.: 1·0 (2), 1·5 (26), 2·0 (56), 2·5 (33), 3·0 (7).

4.1+: **4** Ind. cm.: 45, 50, 60 (2). Av.: **53·75** cm.
kg.: 1·5 (2), 2·0 (2). Av.: **1·75** kg.

2.2+: **16** Ind. (2 ♂, 14 ♀). Av.: **82·63** (♀♀: 82·0) cm., **7·41** (♀♀: 7·21) kg.
cm.: 61, 70, 80 (5), 82 (♂), 83, 85, 87, 89, 90, 91, 92, 92 (♂).
kg.: 5·0, 6·0, 6·5, 7·0 (3), 7·5 (5), 8·0, 8·5 (2), 8·5 (♂), 9·0 (♂).

3.2+: **64** Ind. (5 ♂, 59 ♀). Av.: **86·42** (♂♂: 90·0, ♀♀: 86·12) cm., **7·71** (♂♂: 7·9, ♀♀: 7·09) kg.
cm.: 65, 70 (3), 75, 78, 80 (7), 82, 83, 85 (12), 86 (3), 87 (4), 89, 90 (13), 91 (2), 92 (3), 93 (4), 94 (3), 95 (3), 96.
kg.: 3·5, 5·0, 5·5, 6·0 (2), 6·5 (7), 7·0 (5), 7·5 (13), 8·0 (10), 8·5 (17), 9·0 (5), 9·5, 10·5.

4.2+: **3** ♀: 83, 85 and 89 cm., 6·5 (2) and 8·0 kg.

2.3: **22** ♀: cm.: 100 (6), 102 (3), 103, 104, 105 (5), 106 (2), 109, 110, 112 (2). Av.: **104·23** cm.
kg.: 10·0. 11·0 (2), 11·5 (3), 12·0 (4), 12·5 (2), 13·0 (3), 13·5 (2), 14·0 (2), 14·5 (2), 15·0. Av.: **12·61** kg.

3.3: **115** Ind. (14 ♂, 101 ♀). Av.: **106·9** (♂♂: 107·28, ♀♀: 106·84) cm., **13·27** (♂♂: 13·04, ♀♀: 13·31) kg.
cm.: 100 (14), 101 (5), 102 (8), 103 (8), 104 (5), 105 (10), 106 (2), 107 (8), 108 (6), 109 (5), 110 (19), 111 (5), 112 (6), 113, 114 (8), 115 (5).
kg.: 10·0 (6), 10·5 (3), 11·0 (3), 11·5 (7), 12·0 (10), 12·5 (18), 13·0 (10), 13·5 (13), 14·0 (13), 14·5 (7), 15·0 (11), 15·5 (5), 16·0 (7), 16·5 (2).

4.3: **5** Ind. (1 ♂, 4 ♀). cm.: 102, 103, 107, 110 (♂), 116. Av.: **107·6** cm.
kg.: 11·5, 13·0, 14·0 (♂), 15·0 (2). Av.: **13·7** kg.

2.4: **1** ♂: 120 cm., 18·0 kg.

3.4: **2** ♂: 121 and 122 cm., 17·5 and 18·0 kg. — **4** ♀: 110, 115 and 120 (2) cm., 14·5, 15·0, 16·5 and 17·5 kg.

3.5: **3** ♂: 120, 121 and 125 cm., 20·0, 20·5 and 21·0 kg. — 1 ♀: 119 cm., 18·5 kg.

Once spawned: **10** *Ind.*

5-year-olds:
3.1+G+: 1 Ind. 65 cm., 3·0 kg.

6-year-olds:
3.1+G1: 1 ♀: 95 cm., 10·0 kg.

2.2+G1: 1 ♂: 93 cm., 10·0 kg.

7-year-olds:
3.2+G1: 1 ♂: 101 cm., 11·0 kg. — 1 ♀: 103 cm., 13·0 kg.

8-year-olds:
3.3G1: 4 ♀: cm.: 105, 111, 112, 117. Av.: **111·25** cm. — kg.: 12·5, 13·0, 14·0 (2). Av.: **13·38** kg.

9-year-olds:
3.4G1: 1 ♂: 120 cm., 16·5 kg.

Twice spawned: **1** *Ind.*

11-year-olds:
3.4G1G1: 1 ♀: 119 cm., 19·0 kg.

(b). Maijala: **70** Ind.

2.2+: **1** ♂: 81 cm., 6·0 kg. — **6** ♀: cm.: 84 (2), 86, 89, 92, 96. Av.: **88·5** cm.
kg.: 6·0, 7·0, 7·5, 8·0 (2), 8·5. Av.: **7·5** kg.

3.2+: **1** ♂: 91 cm., 7·5 kg. — **19** ♀: cm.: 76, 82 (3), 83, 87 (2), 88, 90 (4), 91, 92 (3), 94 (2), 95. Av.: **88·26** cm.
kg.: 6·0, 6·5 (2), 7·0, 7·5 (4), 8·0 (3), 8·5 (3), 9·0 (3), 9·5, 10·0. Av.: **8·0** kg.

2.3: **1** ♂: 97 cm., 9·0 kg. — **14** ♀: cm.: 95, 100, 102, 103, 104, 105 (4), 106 (3), 108, 110. Av.: **104·29** cm.
kg.: 8·0, 9·0, 11·5 (3), 12·5 (3), 13·0 (4), 14·0 (2). Av.: **12·07** kg.

3.3: **21** Ind. (3 ♂, 18 ♀). Av.: **106·81** (♀♀: 107·83) cm., **13·29** (♀♀: 13·56) kg.
cm.: 95 (♂), 97, 100 (♂), 105 (2), 106 (4), 107 (3), 107 (♂), 108 (2), 109, 110, 111, 114 (2), 115.
kg.: 8·5 (♂), 10·0 (2), 11·0 (♂), 11·5, 12·0, 13·5 (5), 14·0 (3), 14·5 (3), 15·5 (♂), 15·5, 16·0 (2).

2.4: **1** ♂: 119 cm., 20·0 kg.

3.5: **1** ♂: 131 cm., 22·5 kg.

Once spawned: **3** *Ind.*

7-year-olds:
2.3G1: 2 ♀: 110 and 114 cm., 13·5 and 14·0 kg.

8-year-olds:
3.3G1: 1 ♀: 115 cm., 16·0 kg. — 1 ♂: 118 cm., 17·5 kg.

Twice spawned: **1** *Ind.*

10-year-olds:
2.4G1G1: 1 ♀: 123 cm., 17·0 kg.

1940:

(a) Pyhäkoski: **188** Ind.

2.1+: **1** Ind. 53 cm., 1·5 kg.

3.1+: **7** Ind. (3 ♂, 4 ♀). cm.: 42, 45 (2), 45 (♂), 50 (2), 50 (♂), 59. Av.: **48·0** (♀♀: 45·5) cm.
kg.: 1·2, 1·3, 1·3 (♂), 1·6, 2·0, 2·0 (2 ♂). Av.: **1·69** (♀♀: 1·58) kg.

2.2+: **2** ♂: 80 and 89 cm., both 7·0 kg. — **1** ♀: 78 cm., 4·5 kg.

3.2+: **23** Ind. (3 ♂, 20 ♀). Av.: **77·7** (♀♀: 77·4) cm., **5·47** (♀♀: 5·39) kg.
cm.: 67, 70 (5), 71 (♂), 73, 75 (2), 79 (2), 80 (3), 80 (♂), 81, 83 (2), 86, 87, 88 (♂), 90.
kg.: 3·0 (♂), 3·5, 4·0 (4), 4·5, 5·0, 5·5 (3), 6·0 (7), 6·0 (♂), 6·5, 7·0, 7·5, 9·0 (♂).

4.2+: **3** ♀: 80 and 85 (2) cm., 5·5, 6·8 and 7·5 kg.

2.3: **27** Ind. (2 ♂, 25 ♀). Av.: **103·89** (♀♀: 103·28) cm., **12·59** (♀♀: 12·34) kg.
cm.: 94, 95, 98, 100 (4), 101 (2), 102 (3), 103 (2), 104, 105 (3), 106, 107, 108 (2), 109, 110 (♂), 111, 113, 113 (♂).
kg.: 10·0 (3), 10·5, 11·0 (2), 11·5 (3), 12·0 (3), 12·5 (4), 13·0 (3), 13·5 (2), 14·0, 14·5, 15·0 (♂), 15·0, 16·0, 16·5 (♂).

3.3: **98** Ind. (6 ♂, 92 ♀). Av.: **102·62** (♂♂: 109·17, ♀♀: 102·2) cm., **12·45** (♂♂: 16·25, ♀♀: 12·21) kg.
cm.: 90 (2), 95 (5), 97 (3), 99 (3), 100 (18), 101, 102 (11), 103 (16), 104 (11), 105 (12), 105 (♂), 106, 107 (2), 108 (3), 109, 109 (2 ♂), 110 (2), 110 (2 ♂), 111, 112 (♂).

kg.: 8·5, 10·0 (8), 10·5 (5), 11·0 (9), 11·5 (11), 12·0 (14), 12·5 (9), 13·0 (13), 13·5 (7), 14·0 (10), 14·5, 15·0 (♂), 15·5 (2 ♂), 15·5 (2), 16·0 (♂), 16·5 (♂), 18·5, 19·0 (♂).

4.3: 5 ♀: cm.: 95, 102, 103, 105 (2). Av.: **102·0** cm.
kg.: 10·5, 11·5, 12·5 (2), 15·0. Av.: **12·4** kg.

2.4: **1** ♀: 113 cm., 15·0 kg.

3.4: **10** Ind. (4 ♂, 6 ♀). cm.: 109 (♂), 110, 114, 114 (♂), 117 (3), 118 (♂), 119, 127 (♂). Av.: **116·2** cm.
kg.: 14·0, 14·0 (♂), 16·0, 17·5, (3) 18·0, 18·5 (♂), 20·5 (2 ♂). Av.: **17·42** (♂♂: 18·38, ♀♀: 16·78) kg.

4.4: **1** ♀: 112 cm., 15·5 kg.

2.5: **1** ♂: 120 cm., 23·0 kg.

Once spawned: **8** *Ind.*

4-year-olds:
2.1+G+: 1 ♀: 64 cm., 3·0 kg.

5-year-olds:
2.1+G1: 1 ♀: 94 cm., 9·0 kg.

6-year-olds:
2.1+G2: 1 ♀: 104 cm., 11·5 kg.
3.1+G1: 1 ♂: 95 cm., 8·5 kg.

8-year-olds:
3.3G1: 3 ♀: 105 (2) and 107 cm., 13·5, 14·0 and 15·0 kg.

9-year-olds:
3.4G1: 1 ♂: 120 cm., 17·5 kg.

(b) Maijala: **123** Ind.

2.1+: **2** Ind. 50 and 52 cm., both 1·5 kg.
3.1+: **4** Ind. 50, 53 and 55 (2) cm., 1·5 (2), 1·7 and 1·8 kg.

2.2+: **1** ♂: 80 cm., 5·0 kg.
3.2+: **15** Ind. (3 ♂, 12 ♀). Av.: **78·6** (♀♀: 80·25) cm., **5·57** (♀♀: 5·96) kg.
cm.: 65 (♂), 68 (♂), 71, 72, 75, 78 (2), 80, 83 (3), 83 (♂), 85 (2), 90.
kg.: 3·0 (2 ♂), 4·5 (2), 5·0, 5·5 (2), 6·0 (2), 6·0 (♂), 6·5 (2), 7·0 (2), 7·5.

2.3: **12** Ind. (1 ♂, 11 ♀). cm.: 102, 104 (2), 105, 106 (2), 107 (2), 108, 109, 110, 115 (♂). Av.: **106·18** cm. (♀♀).
kg.: 12·0 (2), 12·5 (3), 13·0, 13·5 (3), 14·0 (2), 15·5 (♂). Av.: **13·0** kg. (♀♀).

3.3: **68** Ind. (3 ♂, 65 (♀). ♂♂: 109, 110 and 123 cm., 13·0, 14·5 and 18·5 kg.
♀♀: cm.: 90, 99, 100 (2), 101 (2), 102 (10), 103 (4), 104 (4), 105 (8), 106 (3), 107 (6), 108 (7), 109 (5), 110 (7), 111 (3), 112 (2). Av.: **105·65** cm.
kg.: 7·0, 8·0, 10·0, 10·5 (3), 11·0 (5), 11·5 (2), 12·0 (8), 12·5 (10), 13·0 (9), 13·5 (8), 14·0 (8), 14·5 (7), 15·0 (2). Av.: **12·68** kg.

3.4: **1** ♂: 129 cm., 19·0 kg. — **7** ♀: cm.: 107, 113, 114, 115 (2), 120, 123. Av.: **115·29** cm.
kg.: 14·5, 15·0, 15·5 (2), 16·5, 17·0, 18·0. Av.: **16·0.**

Once spawned: **5** *Ind.*

6-year-olds:
3.1+G1: 1 ♂: 75 cm., 8·5 kg. — 1 ♀: 93 cm., 9·0 kg.

7-year-olds:
3.1+G2: 1 ♂: 110 cm., 14·5 kg. — 1 ♀: 104 cm., 12·5 kg.
3.2+G1: 1 ♀: 92 cm., 9·0 kg.

Twice spawned: **3** *Ind.*

10-year-olds:
3.3G1G1: 3 ♀: 110, 119 and 120 cm., 11·5, 15·0 and 16·5 kg.

1941:

(c) Merikoski:

2.2+: **4** ♂: 80, 82, 86 and 90 cm. Av.: **84·5** cm.
4·5, 5·0 and 6·0 (2) kg. Av.: **5·38** kg.
3.2+: **3** ♂: cm.: 70, 83 and 85 cm. Av.: **79·33** cm.
kg.: 4·0 and 5·5 (2) kg. Av.: **5·0**
3 ♀: cm.: 66, 81 and 85. Av.: **77·33** cm.
kg.: 4·5, 6·0 and 6·5. Av.: **5·67** kg.

2.3: **18** ♀: cm.: 95, 99, 103 (6), 105, 106 (2), 107 (2), 109, 110 (2), 111, 112. Av.: **105·28** cm.
kg.: 8·0, 9·5 (2), 10·5 (2), 11·0 (3), 11·5 (3), 12·0 (4), 12·5, 13·0 (2). Av.: **11·22** kg.

3.3: **79** Ind. (11 ♂, 68 ♀). Av.: **102·18** (♂♂: 103·0, ♀♀: 102·04) cm., **10·80** (♂♂: 11·05, ♀♀: 10·76) kg.
cm.: 80, 84, 86, 89, 90 (2), 91, 95 (5), 98, 99 (5), 100 (11), 101 (3), 102 (5), 103 (9), 104 (4), 105 (12), 106 (2), 107 (2), 108 (2), 110 (4), 112 (2), 113, 114, 115 (3).
kg.: 7·5 (2), 8·0 (4), 8·5 (2), 9·0 (8), 9·5 (5), 10·0 (7), 10·5 (6), 11·0 (14), 11·5 (9), 12·0 (8), 12·5 (5), 13·0 (4), 13·5 (3), 14·0 (2).

4.3: **2** ♀: 103 and 106 cm., 12·5 and 13·0 kg.

2.4: **6** Ind. 2 ♂: 110 and 125 cm., 13·0 and 16·5 kg. — 4 ♀: 115 (2), 120 and 125 cm., 13·0, 15·0, 15·5 and 16·0 kg.

3.4: **17** Ind. (8 ♂, 9 ♀). Av.: **121·0** (♂♂: 122·75, ♀♀: 119·44) cm., **17·0** (♂♂: 17·31, ♀♀: 16·72) kg.
cm: 112, 115 (2), 117, 119 (2), 120 (2), 121, 124 (4), 125 (2), 126, 127.
kg.: 14·5 (2), 15·5, 16·0, 16·5 (2), 17·0 (4), 17·5, 18·0 (4), 19·0 (2).

4.4: **1** ♀: 120 cm., 14·5 kg.

3.5: **2** ♂: 125 and 130 cm., 18·0 and 19·5 kg. — 1 ♀: 130 cm., 19·0 kg.

Once spawned: **25** *Ind.*

6-year-olds:
3.1+G1: 2 ♂: 81 and 90 cm., 6·5 and 7·0 kg. — 3 ♀: 83, 85 and 88 cm., 6·0 (2) and 7·0 kg.

7-year-olds:
3.2+G1: 3 ♂: 92, 94 and 99 cm., 8·0, 8·5 and 9·0 kg. — 2 ♀: 95 and 104 cm., both 9·5 kg.

3.3G+: 1 ♀: 105 cm., 11·5 kg.

2.4G+: 1 ♂: 130 cm., 20·5 kg.

8-year-olds:
3.3G1: 1 ♂: 112 cm., 14·0 kg. — **6** ♀: 105, 110 (3), 115, 117 cm., Av.: **111·17** cm.
kg.: 10·0, 10·5, 12·0, 14·0 (2), 14·5. Av.: **12·5** kg.

9-year-olds:
4.3G1: 1 ♂: 101 cm., 13·5 kg.

3.4G1: 1 ♂: 122 cm., 15·0 kg. — **4** ♀: 118, 119, 120 and 125 cm. Av.: **120·5** cm. — 13·0, 15·0 (2), 19·0 kg. Av.: **15·5** kg.

Twice spawned: **3** *Ind.*

8-year-olds:
3.2+G1G+: 1 ♀: 105 cm., 8·5 kg.

2.3G1G+: 1 ♀: 107 cm., 11·5 kg.

10-year-olds:
3.3G1G1: 1 ♀: 115 cm., 11·5 kg.

Three times spawned: **2** *Ind.*

11-year-olds:
3.2+G1G1G1: 1 ♀: 114 cm., 14·0 kg.

12-year-olds:
3.3G1G1G1: 1 ♀: 113 cm., 10·5 kg.

1942:

(c) Merikoski: **321** Ind.

2.2+: **31** Ind. (25 ♂, 6 ♀). Av.: **76·26** (♂♂: 76·92, ♀♀: 73·5) cm., **4·15** (♂♂: 4·2, ♀♀: 3·92) kg.
cm.: 62, 67, 71, 72 (3), 73 (3), 75 (7), 76 (3), 78 (2), 79, 80 (3), 81, 82, 83, 85 (3).
kg.: 3·0, 3·5 (8), 4·0 (10), 4·5 (7), 5·0 (4), 6·0.

3.2+: **92** Ind. (61 ♂, 31 ♀). Av.: **76·48** (♂♂: 76·05, ♀♀: 77·32) cm., **4·46** (♂♂: 4·3, ♀♀: 4·76) kg.
cm.: 58, 64, 65, 67 (2), 70 (4), 71 (2), 72 (5), 73 (5), 74 (4), 75 (14), 76 (10), 77 (7), 78 (7), 79, 80 (9), 81 (6), 82 (4), 83 (2), 84, 85 (4), 87 (2).
kg.: 3·0 (2), 3·5 (21), 4·0 (17), 4·5 (18), 5·0 (17), 5·5 (11), 6·0 (6).

2.3: **32** Ind. (5 ♂: 27 ♀). Av.: **96·88** (♂♂: 99·0, ♀♀: 96·48) cm., **9·27** (♂♂: 10·1, ♀♀: 9·11) kg.
cm.: 85, 89, 90 (3), 92 (2), 93 (2), 95 (5), 96, 97 (3), 98 (2), 100 (6), 102 (2), 105 (2), 106, 108.
kg.: 6·5, 7·5 (4), 8·0 (4), 8·5 (3), 9·0 (4), 9·5 (6), 10·0 (4), 11·0 (2), 11·5 (2), 12·0, 12·5.

3.3: **73** Ind. (6 ♂, 67 ♀). ♂♂: 84, 93, 102, 103 and 105 (2) cm., Av.: **98·67** cm. — kg.: 6·5, 8·5, 11·0 (2), 12·0 and 12·5. Av.: **10·25** kg.
♀♀: cm.: 82, 83 (2), 87, 90 (2), 92 (3), 93 (6), 94 (3), 95 (10), 96 (4), 97, 98 (3), 99 (2), 100 (11), 101 (2), 102 (5), 104 (2), 105 (3), 107, 109, 111. Av.: **97·39** cm.
kg.: 6·0 (3), 6·5 (3), 7·5 (5), 8·0 (7), 8·5 (10), 9·0 (8), 9·5 (4), 10·0 (11), 10·5, 11·0 (4), 11·5 (5), 12·0, 12·5 (2), 13·0, 13·5, 15·5. Av.: **9·36** kg.

2.4: **6** ♀: cm.: 107, 110 (2), 113, 115 and 116. Av.: **111·83** cm.
kg.: 12·0 (2), 13·5, 14·0, 15·0 and 15·5. Av.: **13·67** kg.

3.4: **60** Ind. (17 ♂, 43 ♀). Av.: **112·3** (♂♂: 116·65, ♀♀: 110·58) cm., **14·27** (♂♂: 15·68, ♀♀: 14·1) kg.
cm.: 97 (2), 106 (3), 107 (3), 108 (3), 109 (3), 110 (13), 111, 112 (4), 113 (6), 114 (3), 115 (4), 116 (3), 117 (6), 120 (2), 122, 123, 125 (2).
kg.: 8·5, 10·0, 10·5, 11·5, 12·0, 12·5 (4), 13·0 (8), 13·5 (4), 14·0 (4), 14·5 (9), 15·0 (9), 15·5, 16·0 (4), 16·5 (4), 17·0 (2), 17·5 (2), 18·0, 19·0, 19·5, 20·0.

4.4: **1** ♀: 115 cm., 15·5 kg.

3.5: **3** ♂: 124 and 129 (2) cm. — 19·0, 20·0 and 21·0 kg.

Once spawned: **17** *Ind.*

5-year-olds: **2.1+G1**: 1 ♀: 83 cm., 6·0 kg.

6-year-olds:
3.1+G1: 1 ♂: 89 cm., 7·0 kg.

7-year-olds:
3.1+G2: 1 ♂: 109 cm., 13·0 kg. — 2 ♀: 106 and 109 cm., both 12·5 kg.

2.3G1: 1 ♂: 116 cm., 18·5 kg. — **4** ♀: 107, 110, 115 and 120 cm., 10·0, 14·0, 15·5 and 16·5 kg.

8-year-olds:
3.3G1: 2 ♂: 110 and 115 cm., 12·0 and 15·0 kg. — **7** ♀: 105, 110 (2), 111, 113, 114 and 115 cm. Av.: **111·14** cm., 11·5, 13·5, 14·0, 14·5 (2), 15·0 and 16·0 kg. Av.: **14·4** kg.
3.4G1: 1 ♂: 120 cm., 18·0 kg. — 1 ♀: 119 cm., 16·5 kg.

Twice spawned: **2** *Ind.*

9-year-olds:
2.3G1G1: 1 ♀: 111 cm., 15 kg.

10-year-olds:
3.3G1G1: 1 ♀: 112 cm., 15 kg.

1943.

(c) Merikoski: **183** Ind.

2.2+: 9 ♂: cm.: 69, 70 (2), 71 (2), 73, 74, 75, 78. Av.: **72·33** cm. — 3·5 (4), 4·0 (2), 4·5 (3). Av.: **3·94** kg.

3.2+: **34** Ind. (32 ♂, 2 ♀). Av.: **71·21** cm. (♂♂: 70·81) cm., **3·79** (♂♂: 3·73) kg.
cm.: 60, 66 (3), 67 (5), 68, 69 (2), 70 (4), 71 (2), 72 (2), 73 (3), 74, 75 (4), 76 (2), 77, 77 (♀), 78 (♀), 79.
kg.: 3·5 (21), 4·0 (7), 4·5 (4), 4·5 (♀), 5·0 (♀).

4.2+: **1** ♀: 75 cm., 4·5 kg.

2.3: **7** Ind. (1 ♂, 6 ♀). Av.: **89·86** (♀♀: 90·67) cm., **8·14** (♀♀: 8·50) kg.
cm.: 82, 85 (♂), 89, 90, 91, 92, 100.
kg.: 6·0 (♂), 6·5, 7·5, 8·5, 9·0 (2), 10·5.

3.3: **97** Ind. (27 ♂, 70 ♀). Av.: **88·93** (♂♂: 92·44, ♀♀: 87·57) cm., **7·86** (♂♂: 8·54, ♀♀: 7·60) kg.
cm.: 78 (2), 80 (10), 82 (4), 83 (5), 85 (5), 86 (7), 87 (8), 88 (7), 89 (3), 90 (12), 91 (2), 92 (7), 93 (3), 94, 95 (9), 96 (2), 97 (2), 98, 99, 100 (3), 101 (2), 102.
kg.: 5·0 (3), 5·5 (4), 6·0 (10), 6·5 (9), 7·0 (10), 7·5 (10), 8·0 (10), 8·5 (11), 9·0 (11), 9·5 (10), 10·0 (6), 11·0, 11·5, 12·0.

2.4: **11** Ind. (3 ♂, 8 ♀). Av.: **102·64** (♂♂: 108·0, ♀♀: 100·63) cm., **11·59** (♂♂: 13·33, ♀♀: 10·94) kg.

cm.: 96, 97, 98, 100, 102 (2), 104, 105 (2), 110 (2).
kg.: 9·0, 10·0 (2), 10·5 (2), 12·5 (3), 13·0, 13·5 (2).

3.4: **16** Ind. (7 ♂, 9 ♀). Av.: **105·25** (♂♂: 112·29, ♀♀: 99·78) cm., **12·09** (♂♂: 13·0, ♀♀: 11·39) kg.
cm.: 95, 98 (2), 99, 100 (2), 102 (2), 104, 110 (2), 112, 113 (2), 114 (2).
kg.: 9·5, 10·0, 10·5, 11·0, 11·5 (2), 12·0 (3), 12·5 (3), 13·5 (2), 14·0, 15·0.

2.5: **1** ♀: 116 cm., 17·0 kg.
3.5: **1** ♂: 115 cm., 11·5 kg.

Once spawned: **6** *Ind.*

6-year-olds:
3.1+G1: 1 ♀: 83 cm., 5·5 kg.

7-year-olds:
3.1+G2: 1 ♂: 98 cm., 11·0 kg.

3.2+G1: 1 ♀: 92 cm., 9·5 kg.

3.3G+: 2 ♀: 101 and 103 cm. — 10·0 and 14·0 kg.

8-year-olds:
3.3G1: 1 ♀: 102 cm., 11·5 kg.

1944.

(c) Merikoski: **749** Ind.

2.2+: **10** Ind. (4 ♂, 6 ♀). Av.: **75·6** (♂♂: 71·0, ♀♀: 78·67) cm., **5·0** (♂♂: 4·5, ♀♀: 5·33) kg.
cm.: 63, 73 (2), 75 (3), 80 (3), 82.
kg.: 3·5, 4·0 (2), 4·5, 5·0, 5·5 (3), 6·0, 6·5.

3.2+: **30** Ind. (17 ♂, 13 ♀). Av.: **72·67** (♂♂: 70·65, ♀♀: 75·30) cm., **4·55** (♂♂: 4·26, ♀♀: 4·92) kg.
cm.: 55, 58, 60, 64, 65, 67 (2), 69, 70 (2), 71, 72 (2), 73, 75 (5), 76, 77, 78 (2), 79, 80 (4), 81, 83.
kg.: 3·0 (2), 3·5 (4), 4·0 (6), 4·5 (6), 5·0 (6), 5·5 (4), 6·5, 7·0.

4.2+: **1** ♀: 82 cm., 6·0 kg.

2.3: **9** Ind. (1 ♂, 8 ♀). Av.: **96·0** (♀♀: 95·5) cm., **8·39** (♀♀: 8·0) kg.
cm.: 82, 85, 86, 100 (2), 100 (♂), 102.
kg.: 5·5, 6·0 (2), 7·5, 9·0, 9·5 (2), 11·0, 11·5.

3.3: **80** Ind. (14 ♂, 66 ♀). Av.: **94·40** (♂♂: 94·21, ♀♀: 90·80) cm., **7·97** (♂♂: 8·68, ♀♀: 7·82) kg.
cm.: 82 (2), 84 (2), 85 (3), 86 (6), 87, 88 (9), 89, 90 (16), 91 (5), 92 (8), 93 (3), 94, 95 (9), 96 (3), 97, 98 (4), 99, 100 (2), 101, 102, 103.
kg.: 6·0, 6·5 (10), 7·0 (12), 7·5 (13), 8·0 (18), 8·5 (4), 9·0 (13), 9·5 (4), 10·0 (3), 10·5, 11·5.

4.3: **3** ♀: 89, 92, 100 cm. Av.: **93·67** cm. — 7·5, 8·0, 9·0 kg. Av.: **8·17** kg.

2.4: **50** Ind. (6 ♂, 44 ♀). Av.: **105·76** (♂♂: 110·17, ♀♀: 105·16) cm., **12·12** (♂♂: 13·75, ♀♀: 11·90) kg.
♂♂: cm: 100, 110 (3), 113, 118.
kg.: 11·0, 12·5, 13·5, 14·0, 14·5, 17·0.
♀♀: cm: 95, 97, 98 (4), 100 (3), 101, 102 (2), 103, 104 (3), 105 (5), 106 (4), 107 (5), 108 (6), 109, 110 (3), 111, 112, 114, 115.
kg.: 9·0 (2), 9·5 (2), 10·0 (5), 10·5 (3), 11·0 (5), 11·5 (5), 12·0 (3), 12·5, 13·0 (8), 13·5 (5), 14·0 (2), 14·5 (2), 15·5.

3.4: **542** Ind. (101 ♂, 441 ♀). Av.: **104·81** (♂♂: 106·82, ♀♀: 104·34) cm., **11·91** (♂♂: 12·90, ♀♀: 11·68) kg.
cm.: 90 (6), 91, 93 (2), 94 (2), 95 (16), 96 (7), 97 (9), 98 (18), 99 (11), 100 (56), 101 (27), 102 (34), 103 (28), 104 (20), 105 (85), 106 (36), 107 (10), 108 (37), 109 (18), 110 (52), 111 (13), 112 (9), 113 (11), 114 (7), 115 (17), 116, 117 (2), 118, 119, 120 (5).
kg.: 7·0 (3), 8·0 (10), 8·5 (15), 9·0 (19), 9·5 (29), 10·0 (52), 10·5 (41), 11·0 (49), 11·5 (42), 12·0 (73), 12·5 (34), 13·0 (40), 13·5 (27), 14·0 (34), 14·5 (25), 15·0 (14), 15·5 (14), 16·0 (7), 16·5, 17·0 (6), 17·5 (3), 18·0 (3), 18·5.

4.4: **5** Ind. (2 ♂, 3 ♀). cm.: 95, 103, 108, 108 (♂), 116 (♂). Av.: **106·0** cm. — kg.: 11·0 (2), 12·0, 12·0 (♂), 18·0 (♂). Av.: **12·80** kg.

2.5: **1** ♂: 123 cm., 19·0 kg.
3.5: **2** ♂: 115 and 118 cm., 14·0 and 15·5 kg.

Once spawned: **16** *Ind.*

6-year-olds:
3.1+G1: 1 ♀: 78 cm., 5·5 kg.

2.2+G1: 1 ♀: 102 cm., 11·5 kg.

7-year-olds:
3.2+G1: 2 ♀: 80 and 96 cm., 5·0 and 10·0 kg.

2.3G1: 1 ♀: 100 cm., 10·5 kg.

8-year-olds:
3.3G1: **10** ♀: cm.: 99, 100 (2), 104 (2), 105 (3), 106, 110. Av.: **103·8** cm.
kg.: 9·0, 10·0, 11·0, 11·5, 13·0 (2), 13·5, 14·0, 15·0 (2). Av.: **12·50** kg.

3.4G+: 1 ♀: 100 cm., 11·5 kg.

9. Kokemäki River: Lukkarinsanta.

1936: **227** Ind.

2.1+: **1** ♀: 60 cm., 2·0 kg.

2.2+: **13** Ind. (5 ♂, 8 ♀). Av.: **73·23** (♂♂: 75·4, ♀♀: 71·88) cm., **5·19** (♂♂: 5·1, ♀♀: 5·25) kg.
cm.: 62, 65, 70 (2), 72, 75 (5), 78, 80.
kg.: 4·0 (2), 4·5, 5·0 (6), 6·0 (3), 7·0.

3.2+: **6** Ind. (2 ♂, 4 ♀). cm.: 60, 62 (♂), 65 (♂), 65, 70, 80. Av.: **67·0** cm. — kg.: 3·0 (2 ♂), 3·0, 5·0, 6·0 (2). Av.: **4·33** kg.

2.3: **175** Ind. (76 ♂, 99 ♀). Av.: **92·61** (♂♂: 96·64, ♀♀: 89·52) cm., **10·54** (♂♂: 12·01, ♀♀: 9·41) kg.
cm.: 80 (11), 85 (33), 87, 90 (51), 92, 95 (28), 98, 100 (31), 105 (17), 110.
kg.: 5·0, 7·0 (8), 7·5, 8·0 (33), 9·0 (32), 10·0 (29), 11·0 (15), 12·0 (14), 13·0 (13), 14·0 (10), 15·0 (12), 16·0 (7).

3.3: **32** Ind. (15 ♂, 17 ♀). Av.: **94·91** (♂♂: 99·13, ♀♀: 91·18) cm., **11·38** (♂♂: 12·8, ♀♀: 10·12) kg.
cm.: 80, 85 (4), 90 (8), 95 (5), 100 (9), 102, 105 (4).
kg.: 6·0, 7·0 (2), 8·0, 9·0 (5), 10·0 (5), 11·0, 12·0 (3), 13·0 (7), 14·0 (2), 15·0 (5).

2.4: **26** Ind. (25 ♂, 1 ♀). cm.: 105 (5), 110 (15), 115 (6). Av.: **110·19** (♀: 105·0) cm.
kg.: 14·0 (2), 15·0 (4), 16·0 (4), 17·0 (2), 18·0 (4), 18·0 (♀), 19·0 (5), 20·0 (3), 21·0. Av.: **17·38** kg.
3.4: **2** ♂: 110 and 120 cm., 17·0 and 20·0 kg.

Once spawned. **19** *Ind.*

6-year-olds:
2.2+G1: 1 ♂: 95 cm., 15·0 kg. — 3 ♀: all 95 cm., 7·0 (2) and 12·0 kg.

7-year-olds:
2.3G1: **12** Ind. (5 ♂, 7 ♀). Av.: **102·08** (♂♂: 104·0, ♀♀: 100·7) cm., **13·42** (♂♂: 14·0, ♀♀: 13·0) kg.
cm.: 95 (2), 98, 100 (3), 102, 105 (4), 115.
kg.: 11·0, 12·0 (3), 13·0, 14·0 (5), 15·0, 16·0.
3.2+G1: 1 ♀: 85 cm., 9·0 kg.

8-year-olds:
3.3G1: 1 ♂: 109 cm., 16·0 kg. — 1 ♀: 90 cm., 10·0 kg.

Twice spawned: **3** *Ind.*

9-year-olds:
2.3G1G1: 3 ♂: cm.: 100 (2) and 105. — kg.: 13·0, 14·0 and 17·0.

1937: **168** Ind.

2.2+: **9** Ind. (5 ♂, 4 ♀). Av.: **74·44** (♂♂: 74·4, ♀♀: 74·5) cm., **5·33** (♂♂: 5·30, ♀♀: 5·38) kg.
cm.: 70 (2), 72, 75 (3), 76, 78, 79.
kg.: 4·0, 4·5 (2), 5·0 (2), 6·0 (3), 7·0.

2.3: **72** Ind. (31 ♂, 41 ♀). Av.: **92·75** (♂♂: 95·94, ♀♀: 90·34) cm., **10·81** (♂♂: 11·98, ♀♀: 9·92) kg.
cm.: 74, 80, 83, 84, 85 (11), 86, 87, 88 (5), 90 (15), 91, 92 (2), 95 (12), 96, 98, 100 (6), 102 (3), 103 (3), 105 (5), 110.
kg.: 5·0, 7·0 (2), 7·5, 8·0 (8), 8·5, 9·0 (12), 9·5 (3), 10·0 (11), 10·5 (2), 11·0 (6), 12·0 (5), 13·0 (6), 14·0 (5), 15·0 (6), 16·0 (3).

3.3: **32** Ind. (12 ♂, 20 ♀). Av.: **91·78** (♂♂: 95·67, ♀♀: 89·45) cm., **10·54** (♂♂: 12·0, ♀♀: 9·68) kg.
cm.: 75, 80, 83 (3), 85 (2), 86, 88 (2), 90 (6), 92, 94, 95 (5), 96, 97, 100 (4), 102 (2), 103.
kg.: 6·0, 7·0 (2), 7·5, 8·0 (5), 8·5 (2), 9·0 (2), 10·0 (4), 10·5, 11·0 (2), 11·5, 12·0 (3), 13·0 (2), 14·0 (2), 15·0 (3), 16·0.

2.4: **26** Ind. (22 ♂, 4 ♀). Av.: **107·69** (♂♂: 107·64, ♀♀: 108·0) cm., **16·62** (♂♂: 16·61, ♀♀: 16·63) kg.
cm.: 95, 100, 102, 103 (2), 104, 105 (5), 108, 110 (9), 111, 113, 115 (2), 116.
kg.: 11·0, 12·5, 14·5 (2), 15·0 (2), 16·0 (4), 17·0 (7), 17·5, 18·0 (4), 19·0 (3), 20·0.
3.4: **1** ♂: 117 cm., 18·0 kg.

2.5: **1** ♂: 120 cm., 20·0 kg. — **1** ♀: 115 cm., 23·0 kg.

Once spawned: **23** *Ind.*

5-year-olds:
2.1+G1: 1 ♀: 86 cm., 9·0 kg.

6-year-olds:
2.1+G2: 1 ♂: 102 cm., 13·0 kg.
3.1+G1: 1 ♂: 94 cm., 9·0 kg.
2.2+G1: 2 ♀: both 95 cm., and 10·0 kg.

7-year-olds:
2.3G1: **15** Ind. (7 ♂, 8 ♀). Av.: **100·93** (♂♂: 103·86, ♀♀: 98·38) cm., **13·07** (♂♂: 13·64, ♀♀: 12·56) kg.
cm.: 91, 93, 98, 100 (6), 102 (2), 105 (2), 106, 112.
kg.: 10·0, 11·0 (2), 12·0, 12·5 (2), 13·0 (4), 14·0 (2), 15·0 (2), 17·0.

8-year-olds:
2.4G1: 1 ♂: 112 cm., 18·0 kg.
3.3G1: 2 ♀: 98 and 105 cm., both 14·0 kg.

Twice spawned: **3** *Ind.*

9-year-olds:
2.3G1G1: 2 ♀: 102 and 108 cm., both 14·0 kg.

10-year-olds:
3.3G1G1: 1 ♀: 110 cm., 16·0 kg.

1938: **125** Ind.

2.1+: **2** ♂: 58 and 60 cm., 2·2 and 2·5 kg. — 1 ♀: 55 cm., 2·5 kg.

2.2+: **9** ♀: cm.: 70, 75, 77, 78, 80 (4), 85. Av.: **78·33** cm.
kg.: 5·5 (2), 6·0 (2), 6·5, 7·0 (2), 7·5, 8·0. Av.: **6·53** kg.
3.2+: **1** ♂: 85 cm., 8·0 kg. — **7** ♀: cm.: 75 (2), 80 (4), 83.
kg.: 5·0, 6·0 (2), 7·0 (2), 7·5 (2). Av.: **6·57** kg.

2.3: **34** Ind. (16 ♂, 18 ♀). Av.: **97·53** (♂♂: 101·5, ♀♀: 94·0) cm., **11·91** (♂♂: 13·59, ♀♀: 10·42) kg.
cm.: 86, 88 (2), 90 (6), 92, 95 (4), 96, 98 (2), 100 (5), 102 (2), 103 (2), 105 (8).
kg.: 7·0, 8·5, 9·0 (3), 9·5 (3), 10·0 (4), 11·0 (2), 11·5, 12·0 (5), 12·5, 13·0 (2), 14·0 (4), 14·5, 15·0 (5), 16·5.

3.3: **14** Ind. (7 ♂, 7 ♀). Av.: **97·36** (♂♂: 102·29, ♀♀: 92·43) cm., **12·07** (♂♂: 13·86, ♀♀: 10·29) kg.
cm.: 90 (4), 92, 95, 100 (4), 103 (2), 105 (2).
kg.: 9·0 (2), 10·0 (4), 10·5, 13·0 (2), 14·0 (2), 15·0, 15·5, 16·0.

2.4: **10** Ind. (4 ♂, 6 ♀). Av.: **111·60** (♂♂: 109·5, ♀♀: 113·0) cm., **15·25** (♂♂: 16·0, ♀♀: 14·75) kg.
cm.: 105, 109, 110 (2), 112, 113 (2), 114, 115 (2).
kg.: 14·0, 14·5 (2), 15·0 (4), 15·5, 17·0 (2).
3.4: **2** ♂: 110 and 114 cm., 15 and 16·0 kg.

2.5: **1** ♂: 115 cm., 19·0 kg.

Once spawned: **41** *Ind.*

6-year-olds:
2.1+G2: 1 ♂: 93 cm., 11·5 kg.
2.2+G1: 2 ♂: 92 and 100 cm., 11·0 and 14·0 kg. — 1 ♀: 90 cm., 10·5 kg.

7-year-olds:
3.2+G1: 1 ♀: 87 cm., 9·0 kg.

2.3G1: **26** Ind. (11 ♂, 15 ♀). Av.: **99·19** (♂♂: 98·0, ♀♀: 100·07) cm., **12·25** (♂♂: 11·59, ♀♀: 12·73) kg.
cm.: 82, 90, 94 (2), 95 (2), 97, 98 (2), 100 (7), 101, 102 (2), 103, 104 (2), 105 (4).
kg.: 7·0, 8·0, 9·0, 10·0 (2), 10·5, 11·0 (3), 12·0 (3), 13·0 (4), 13·5 (3), 14·0 (2), 14·5 (2), 15·0 (2), 15·5.

8-year-olds:
2.4G1: 1 ♂: 115 cm., 18·0 kg.

3.3G1: **9** Ind. (3 ♂, 6 ♀). cm.: 95 (3), 98, 98 (♂), 100, 102, 105 (♂), 107 (♂). Av.: **94·44** cm.
kg.: 10·5, 11·0 (3), 11·5, 12·0 (♂), 12·5 (♂), 13·0, 15·0 (♂). Av.: **11·94** kg.

Twice spawned: **3** *Ind.*

9-year-olds:
2.3G1G1: 2 ♂: 100 and 102 cm., 13·0 and 15·0 kg.

10-year-olds:
3.3G1G1: 1♀: 100 cm., 10·0 kg.

1939: **60** Ind.

2.1+: **1** ♂: 55 cm., 2·2 kg.

2.2+: **2** ♂: both 80 cm. and 6·0 kg. — **4** ♀: cm.: 78, 80 and 85 (2). — kg.: 5·5, 7·0, 7·5 and 8·0.
3.2+: **1** ♀: 85 cm., 8·0 kg.

2.3: **20** Ind. (13 ♂, 7 ♀). Av.: **97·7** (♂♂: 98·3, ♀♀: 96·57) cm., **12·17** (♂♂: 12·23, ♀♀: 12·07) kg.
cm.: 90 (3), 93, 95 (6), 98, 100 (4), 103, 105 (4).
kg.: 8·5, 9·5 (3), 10·5 (2), 11·0, 11·5 (2), 12·0 (4), 13·0, 14·0, 14·5, 15·0 (2), 16·0 (2).
3.3: **10** Ind. (5 ♂, 5 ♀). Av.: **98·3** (♂♂: 99·0, ♀♀: 97·6) cm., **12·7** (♂♂: 12·8, ♀♀: 12·6) kg.
cm.: 90, 95, 96, 97, 100 (5), 105.
kg.: 9·5, 10·0, 11·0, 12·0, 12·5, 13·5 (2), 14·5, 15·0, 15·5.

2.4: **2** ♂: both 115 cm., 19·5 and 20·0 kg. — **1** ♀: 110 cm., 18·0 kg.
3.4: **1** ♂: 112 cm., 19·0 kg.

Once spawned: **14** *Ind.*

6-year-olds:
3.1+G1: 2 ♂: 82 and 85 cm., 7·0 and 8·0 kg.

2.2+G1: 3 ♀: all 95 cm., 10·5 and 11·0 (2) kg.

2.3G+: 1 ♀: 93 cm., 8·0 kg.

7-year-olds:
3.2+G1: 1 ♀: 90 cm., 8·5 kg.

2.3G1: 3 ♀: all 100 cm., 13·0, 13·5 and 15·0 kg.

8-year-olds:
3.3G1: 2 ♂: 96 and 102 cm., 12·0 and 14·5 kg. 1 ♀: 105 cm., 10·5 kg.

3.4G+: 1 ♂: 110 cm., 16·0 kg.

Twice spawned: **3** *Ind.*

9-year-olds:
2.3G1G1: 2 ♂: 100 and 104 cm., 12·5 and 14·0 kg. 1 ♀: 100 cm., 11·0 kg.

Three times spawned: **1** *Ind.*

12-year-olds:
3.3G1G1G1: 1 ♂: 100 cm., 10·0 kg.

1940: **70** Ind.

2.1+: **1** ♀: 50 cm., 1·5 kg.

2.2+: **5** ♀: cm.: 65, 70, 72, 75, 77. Av.: **71·8** cm.
kg.: 4·0 (3), 5·5, 6·0. Av.: **4·7** kg.
3.2+: **2** ♂: 80 and 85 cm., 6·0 and 7·5 kg.

3.3: **3** ♂: cm.: 95 and 105 (2), kg.: 14·0 (2) and 18·0. **1** ♀: 100 cm., 9·0 kg.
2.3: **43** Ind. (19 ♂, 24 ♀). Av.: **94·44** (♂♂: 97·47, ♀♀: 92·04) cm., **11·9** (♂♂: 12·37, ♀♀: 10·25) kg.
cm.: 80 (4), 85 (5), 90 (9), 92, 95 (8), 97 (2), 98, 100 (4), 105 (5), 107, 110 (3).
kg.: 7·0, 7·5, 8·0 (3), 8·5 (2), 9·0 (6), 9·5, 10·0 (6), 10·5 (3), 11·0 (3), 11·5 (2), 12·0 (2), 12·5, 13·0, 14·0 (4), 14·5 (2), 15·0, 15·5, 16·0, 16·5, 17·0.

2.4: **2** ♂: both 110 cm., 15·5 and 17·0 kg.
3.4: **1** ♂: 120 cm., 16·5 kg.

Once spawned: **10** *Ind.*

5-year-olds:
2.1+G1: 3 ♂: 80, 85 and 90 cm., 6·0, 8·0 and 8·5 kg.

6-year-olds:
2.1+G2: 1 ♀: 107 cm., 16·0 kg.

7-year-olds:
3.2+G1: 1 ♀: 95 cm., 12·0 kg.
2.3G1: 1 ♂: 100 cm., 10·0 kg., 1 ♀: 105 cm., 13·0 kg.

8-year-olds:
3.3G1: 3 ♀: 97, 100 and 105 cm., 10·0 and 13·5 (2) kg.

Twice spawned: **2** *Ind.*

9-year-olds:
2.3G1G1: 2 ♂: 107 and 110 cm., 13·5 and 17·0 kg.

1941: **5** Ind.

1942: **44** Ind.

2.2+: **3** ♀: 60, 70 and 75 cm., 4·5, 5·0 and 5·5 kg.
3.2+: **1** ♂: 75 cm., 5·0 kg.

2.3: **31** Ind. (9 ♂, 22 ♀). Av.: **88·61** (♂♂: 89·0, ♀♀: 88·45) cm., **9·87** (♂♂: 9·67, ♀♀: 9·96) kg.
cm.: 75 (2), 79, 80 (4), 85 (3), 87, 90 (11), 92 (2), 95 (3), 97, 100 (3).
kg.: 7·5 (2), 8·0 (4), 8·3, 8·5, 9·0 (9), 9·5 (2), 10·0 (3), 10·5, 11·0, 11·5 (2), 12·5, 13·5, 14·0 (3).

3.3: **2** ♂: 85 and 95 cm., 8·5 and 10·0 kg. — **2** ♀: 80 and 100 cm., 7·0 and 8·5 kg.
3.4: **1** ♀: 107 cm., 14·0 kg.

Once spawned: **4** *Ind.*

5-year-olds:
2.1+G1: 1 ♂: 75 cm., 6·5 kg.

6-year-olds:
2.2+G1: 2 ♂: 90 and 95 cm., 9·5 and 12·0 kg. — 1 ♀: 80 cm., 7·5 kg.

10. Kymi River: Langinkoski and Ränninkoski.

1936: **310** Ind.

2.1+: **2** ♀: 55 and 57 cm., both 1·7 kg.
3.1+: **2** ♀: 59 and 67 cm., 2·0 and 3·7 kg.

2.2+: **48** Ind. (3 ♂, 45 ♀). Av.: **77·52** (♀♀: 77·04) cm., **5·45** (♀♀: 5·34) kg.
cm.: 62, 67, 71 (2), 72 (2), 73 (4), 75 (2), 76 (7), 77 (5), 78 (4), 79 (6), 80 (5), 81 (2), 82 (♂), 84 (♂), 85, 86, 87 (2), 88 (♂).
kg.: 3·5 (4), 4·0 (2), 4·5 (7), 5·0 (8), 5·5 (12), 6·0 (4), 6·5 (5), 7·0 (2), 7·5, 8·0 (3).
3.2+: **4** ♀: 76, 78 and 86 (2) cm. Av.: **81·5** cm., 5·3, 5·7, 8·0 and 8·1 kg. Av.: **6·78** kg.

2.3: **151** Ind. (25 ♂, 126 ♀). Av.: **94·6** (♂♂: 101·08, ♀♀: 93·32) cm., **9·86** (♂♂: 11·73, ♀♀: 9·44) kg.
cm.: 80, 83 (2), 84 (4), 85 (4), 86, 87, 88 (9), 89 (9), 90 (15), 91 (11), 92 (8), 93 (11), 94 (11), 95 (7), 96 (5), 97 (5), 98 (3), 99 (4), 100 (3), 101 (6), 102 (9), 103 (6), 104 (2), 105 (6), 106 (5), 107, 108 (2).
kg.: 6·0 (2), 6·5 (3), 7·0 (5), 7·5 (5), 8·0 (10), 8·5 (19), 9·0 (19), 9·5 (17), 10·0 (11), 10·5 (9), 11·0 (12), 11·5 (9), 12·0 (4), 12·5 (10), 13·0 (7), 13·5 (2), 14·0 (3), 14·5 (3), 15·0.
3.3: **35** Ind. (12 ♂, 23 ♀). Av.: **96·17** (♂♂: 102·0, ♀♀: 93·17) cm., **10·82** (♂♂: 12·66, ♀♀: 9·87) kg.
cm.: 87, 88, 89 (2), 90 (3), 91, 92, 93 (3), 94 (3), 95 (2), 96 (3), 97 (2), 98 (3), 100 (2), 101, 102, 103 (2), 104, 105 (2), 111.
kg.: 8·0 (3), 8·5 (2), 9·0 (3), 9·5 (2), 10·0 (5), 10.5 (4), 11·0 (4), 11·5, 12·0 (2), 12·5 (3), 13·0, 13·5 (2), 14·0 (2), 15·0.

2.4: **24** Ind. (12 ♂, 12 ♀). Av.: **111·96** (♂♂: 113·58, ♀♀: 110·33) cm., **15·92** (♂♂: 16·52, ♀♀: 15·32) kg.
cm.: 102, 103 (2), 105, 109, 110 (4), 111, 112 (4), 113, 114 (2), 115, 116, 118 (2), 119 (2), 120.
kg.: 12·0, 12·5, 13·1, 13·5, 14·0, 14·5, 15·0, 15·5 (3), 16·0 (4), 16·5 (2), 17·5 (4), 18·0 (2), 18·5 (2).
3.4: **6** Ind. (4 ♂, 2 ♀). cm.: 103 (♀), 112, 114 (♀), 115, 116 118. Av.: **113·0** cm.
kg.: 13·5 (♀), 16·5, 17·0, 17·5, 18·0 (♀), 19·0. Av.: **16·92** kg.

Once spawned: **29** *Ind.*

5-year-olds:
2.1+G1: 1 ♂: 92 cm., 8·5 kg.

6-year-olds:
3.1+G1: 1 ♀: 98 cm., 10·6 kg.
2·2+G1: 2 ♀: 90 and 94 cm., 9·7 and 10·7 kg.
2.3G+: 1 ♂: 104 cm., 8·7 kg., 1 ♀: 87 cm., 12·8 kg.

7-year-olds:
2.3G1: **20** ♀: cm.: 95, 96 (2), 97, 100 (3), 102 (3), 103, 104 (2), 105 (2), 106, 107, 108 (3). Av.: **102·4** cm.
kg.: 9·0, 10·0, 11·0, 11·7 (2), 12·0 (4), 12·5 (3), 12·7, 13·0 (2), 14·0 (2), 14·5, 15·0 (2). Av.: **12·54** kg.

8-year-olds:
3.3G1: 3 ♀: 103, 105 and 115 cm., 11·5, 11·7 and 15·0 kg.

Twice spawned: **9** *Ind.*

8-year-olds:
2.2+G1G1: **5** ♀: cm.: 103, 104, 106 and 108 (2).
kg.: 13·0 (2), 13·5 (2), 14·5.

9-year-olds:
3.2+G1G1: 1 ♀: 109 cm., 16·0 kg.
2.3G1G1: 1 ♂: 116 cm., 18·2 kg., 1 ♀: 110 cm., 13·7 kg.

10-year-olds:
3.3G1G1: 1 ♀: 106 cm., 12·4 kg.

1937: **70** Ind.

2.1+: **2** ♀: 55 and 60 cm., 1·6 and 2·3 kg.

2.2+: **3** ♀: 69, 76 and 84 cm., 2·6, 5·3 and 6·1 kg.
3.2+: **2** ♀: 81 and 83 cm., both 6·0 kg.

2.3: **24** Ind. (3 ♂, 21 ♀). cm.: 89 (2), 91, 92, 93 (3), 94 (2), 95 (2), 97 (3), 98, 100 (2), 101 (2), 103, 103 (♂), 105 (♂), 106, 108 (♂). Av.: **97·25** (♀♀: 96·09) cm.
kg.: 7·0, 8·0, 8·5 (2), 9·0 (5), 9·5, 10·0 (5), 11·0, 11·5 (2), 12·0 (2), 13·5 (3), 14·0. Av.: **10·35** (♀♀: 9·95) kg.
3.3: **7** ♀: cm.: 85, 93 (2), 96, 98, 102, 103. Av.: **95·71** cm.
kg.: 6·5, 7·0, 10·0 (2), 10·5, 12·0, 12·5. Av.: **9·79** kg.

2.4: **8** Ind. (5 ♂, 3 ♀). cm.: 104 (♀), 109, 111, 112 (♀), 113, 113 (♀), 114, 118. Av.: **111·75** cm.
kg.: 11·7, 12·3, 13·8 (♀), 14·5, 15·5 (♀), 16·0, 16·2 (♀). 17·1. Av.: **14·5** kg.
3.4: **1** ♂: 111 cm., 16·0 kg. — **1** ♀: 116 cm., 17·0 kg.

Once spawned: **20** *Ind.*

5-year-olds:
2.1+G1: 2 ♀: 93 and 99 cm., 8·3 and 11·0 kg.
2.2+G+: 1 ♀: 80 cm., 5·0 kg.

6-year-olds:
2.2+G1: **4** ♀: 90, 91, 98 and 108 cm. Av.: **98·75** cm., 8·3, 8·4, 10·1, and 14·4 kg. Av.: **10·3** kg.
2.3G+: 1 ♀: 110 cm., 12·5 kg.

7-year-olds:
3.2+G1: 2 ♀: 93 and 94 cm., 8·6 and 9·0 kg.
2.3G1: 1 ♂: 106 cm., 13·3 kg. — **6** ♀: cm: 98, 100 (3), 101 (2), 106. Av.: **100·9** cm. — kg.: 10·0 (2), 10·5 (3), 11·0, 13·3. Av.: **10·8** kg.

8-year-olds:
3.3G1: 2 ♀: 99 and 108 cm., 10·5 and 11·9 kg.
2.4G1: 1 ♀: 111 cm., 14·0 kg.

Twice spawned: **2** *Ind.*

8-year-olds:
2.2+G1G1: 1 ♀: 109 cm., 13·5 kg.

10-year-olds:
3.3G1G1: 1 ♀: 111 cm., 16·5 kg.

1938: **56** Ind.

2.1+: **4** ♂: 57 (2), 59 and 65 cm., 1·8, 2·0 (2) and 3·0 kg.
3.1+: **1** ♂: 61 cm., 2·0 kg. — 1 ♀: 61 cm., 2·4 kg.

3.2+: **1** ♀: 85 cm., 7·7 kg.

2.3: **1** ♂: 92 cm., 10·1 kg. — **3** ♀: 90, 91 and 98 cm., 8·2, 9·0 and 11·5 kg.
3.3: **17** ♀: cm.: 89, 90, 91, 92 (2), 93 (3), 94 (2), 95, 96 (3), 97 (2), 102. Av.: **94·1** cm.
kg.: 8·0, 8·5 (2), 9·0 (2), 9·5 (4), 10·0 (2), 10·5 (2), 11·0 (2), 11·5, 12·5. Av.: **9·93** kg.

2.4: **4** ♂: cm.: 109, 111, 113 and 114. — kg.: 13·5, 16·5 (2) and 18·5.
3.4: **2** ♂: 105 and 109 cm., both 13·5 kg. — **1** ♀: 115 cm., 15·5 kg.

3.5: 117 cm., 17·0 kg.

Once spawned: **13** *Ind.*

6-year-olds:
2.2+G1: 2 ♀: 93 and 100 cm., 10·5 and 11·8 kg.

7-year-olds:
3.2+G1: 1 ♀: 95 cm., 9·3 kg.

2.3G1: 2 ♂: 104 and 111 cm., 13·3 and 13·7 kg. — **5** ♀:
cm.: 97, 101 (2), 102, 104.
kg.: 11·0, 12·0 (2), 12·5, 13·5 (2).

8-year-olds:
3.3G1: 3 ♀: 103, 108 and 111 cm., 12·0, 14·0 and 14·5 kg.

Twice spawned: **5** *Ind.*

9-year-olds:
2.3G1G1: **5** ♀: cm.: 95, 100, 106, 107 and 115. Av.: **104·6** cm.
kg.: 9·3, 12·5 (2), 14·0, 14·5. Av.: **12·16** kg.

Three times spawned: **2** *Ind.*

11-year-olds:
2.3G1G1G1: 2 ♀: 103 and 110 cm., 11·5 and 12·0 kg.

1939: **17** Ind.

2.1+: **3** ♀: 58, 60 and 63 cm., 1·9 and 2·5 (2) kg.

2.2+: **1** ♂: 84 cm., 6·5 kg. — **10** ♀: cm.: 75, 77, 78, 79, 80 (3), 81, 82, 90. Av.: **80·2** cm.
kg.: 5·2, 5·3, 5·4, 5·8 (2), 6·0, 6·8, 7·0, 8·4. Av.: **6·09** kg.

3.2+: **2** ♀: 75 and 77 cm., 5·5 and 5·6 kg.

2.3: **1** ♀: 91 cm., 9·0 kg.

1943: **8** Ind.

3.1+: **1** ♀: 48 cm., 1·0 kg.

3.2+: **1** ♀: 65 cm., 2·8 kg.

3.3: **1** ♂: 81 cm., 4·9 kg. — **4** ♀: 78, 82, 85 and 90 cm., 4·7, 5·0, 5·5 and 5·9 kg.

Once spawned: **1** *Ind.*

3.3G1: **1** ♂: 106 cm., 10·2 kg.

2. Complementary Information regarding certain Fishing Grounds in the Bothnian Bay.

In the following the catches made in the Kemi, Simo, Kuivaniemi and Ii regions during the years 1936—1944 are dealt with in greater detail than in Table 22, p. 56. The statistics consist of the number of salmon divided into different weight-classes. The total weight and the mean weight of the different weight-classes are given in Table 23, p. 58.

Catch Statistics for various Fishing Grounds in the Bothnian Bay in 1936—1944.

Number of Fishes.

Weight-Classes	1936	1937	1938	1939	1940	1941	1942	1943	1944
Kemi Region: 1. Muurola Weir (Rovaniemi)									
>19·0	1	2	2	—	—	3	—	—	—
14·5—19·0	21	16	35	16	14	38	11	—	8
9·0—14·0	153	75	137	109	128	446	84	62	174
4·0— 8·5	45	7	71	70	164	58	484	191	187
≤ 3·5	—	3	8	17	8	28	—	—	181
Total ...	**220**	**103**	**253**	**212**	**314**	**573**	**579**	**253**	**550**
2. Köngäs Weir (Tervola)									
>19·0	1	1	1	1	—	2		—	—
14·5—19·0	23	17	18	11	3	15	7	1	1
9·0—14·0	98	46	62	63	77	132	24	35	7
4·0— 8·5	70	44	76	91	70	43	88	123	25
≤ 3·5	6	1	11	83	—	19	6	—	30
Total ...	**198**	**109**	**168**	**249**	**150**	**211**	**125**	**159**	**63**
3. Ajoksenkrunni (in the Sea)									
>19·0	—	1	—	—	—				
14·5—19·0	25	18	7	3	1	—	5	—	—
9·0—14·0	120	80	107	86	37	—	57	—	—
4·0— 8·5	105	70	38	69	115	—	122	—	—
≤ 3·5	39	8	63	46	68	—	15	—	—
Total ...	**289**	**177**	**215**	**204**	**221**	—	**199**	—	—
4. Valkeakari (in the Sea)									
>19·0	—	4	8	—	—	—	—	—	—
14·5—19·0	77	34	32	15	28	—	—	49	—
9·0—14·0	673	491	205	234	254	—	—	176	—
4.0— 8·5	275	70	156	420	393	—	—	31	—
≤ 3·5	81	95	170	540	90	—	—	1	—
Total ...	**1106**	**694**	**571**	**1209**	**765**	—	—	**257**[1])	—
5. Kallio, Inakari, Sarvi (in the Sea)									
>19·0	1	1	—	2	5	3	1	—	2
14·5—19·0	8	5	4	14	16	20	6	2	3
9·0—14·0	24	32	19	40	75	96	45	40	45
4·0— 8·5	23	15	12	63	103	57	56	148	87
≤ 3·5	2	4	21	133	17	20	11	19	37
Total ...	**58**	**57**	**56**	**252**	**216**	**196**	**119**	**209**	**174**
Maksniemi Region: 1. Halttari, Haikara, Junno, Ykskivi									
>19·0	3	—	—	—	—	—	—	—	—
14·5—19·0	73	2	5	—	3	—	—	—	27
9·0—14·0	312	479	277	594	349	690	898	214	569
4·0— 8·5	230	64	92	247	269	193	251	1199	838
≤ 3·5	45	37	249	748	46	19	25	117	907
Total ...	**663**	**582**	**623**	**1589**	**667**	**902**	**1174**	**1530**	**2341**[2])

[1]) Only from Pensaskari ground.
[2]) Also from Ykskuusi ground.

Weight-Classes	1936	1937	1938	1939	1940	1941	1942	1943	1944
2. Karvo, Leuka, Röyttä, Ykskuusi									
>19·0	2	5	—	—	—	—	—	—	—
14·5—19·0	52	97	—	6	—	—	—	14	—
9·0—14·0	269	503	348	472	610	994	1200	710	1071
4·0— 8·5	387	348	141	500	586	415	500	1091	579
≦3·5	48	51	259	355	244	127	153	283	1154
Total ...	**758**	**1004**	**748**	**1333**	**1440**	**1536**	**1853**	**2098**	**2804**[1])
Simoniemi Region: 1. Koivuluoto									
>19·0	—	—	—	—	—	—	—	—	—
14·5—19·0	37	2	—	3	—	4	—	—	11
9·0—14·0	122	108	48	12	82	91	107	96	87
4·0— 8·5	61	22	28	136	134	40	105	155	101
≦3·5	5	1	42	—	32	10	28	35	135
Total ...	**225**	**133**	**118**	**151**	**248**	**145**	**240**	**286**	**334**
2. Pihlajakari, Rajaletto.									
>19·0	—	—	1	—	—	—	—	—	—
14·5—19·0	10	7	3	1	1	6	—	—	—
9·0—14·0	50	64	24	14	32	70	52	32	91
4·0— 8·5	30	32	23	123	43	33	88	87	53
≦3·5	9	6	53	49	18	30	11	19	52
Total ...	**99**	**109**	**104**	**187**	**94**	**139**	**151**	**138**	**196**
3. Montaja, Hunskeri etc.									
>19·0	—	—	—	—	—	—	—	—	—
14·5—19·0	18	—	4	4	—	—	9	—	13
9·0—14·0	354	282	81	54	161	171	154	120	118
4·0— 8·5	135	66	64	179	203	80	327	260	138
≦3·5	19	19	54	132	23	44	68	44	153
Total ...	**526**	**367**	**203**	**369**	**387**	**295**	**558**	**424**	**422**
4. Vatunki, Haarakuusi, Virtaniemi, Maalahti (Plassi)									
>19·0	—	—	—	—	—	—	—	—	—
14·5—19·0	32	7	12	1	4	6	—	—	10
9·0—14·0	81	183	55	34	123	119	94	79	129
4·0— 8·5	61	45	53	125	142	56	161	175	155
≦3·5	16	14	93	87	37	15	31	49	161
Total ...	**190**	**249**	**213**	**247**	**306**	**196**	**286**	**303**	**455**
Simonkylä Region: 1. Tiuranen									
>19·0	—	—	1	—	—	—	—	—	—
14·5—19·0	12	20	5	2	3	15	1	3	11
9·0—14·0	341	306	55	43	164	304	184	193	162
4·0— 8·5	118	66	49	161	188	109	390	297	227
≦3·5	10	27	51	73	21	26	84	92	170
Total ...	**481**	**419**	**161**	**279**	**376**	**454**	**659**	**585**	**570**

[1]) Also from Ajoksenkrunni ground.

Weight-Classes	1936	1937	1938	1939	1940	1941	1942	1943	1944
2. Korkeakari									
>19·0	—	2	—	—	—	—	—	—	—
14·5—19·0	2	4	—	—	—	2	—	—	—
9·0—14·0	131	80	12	7	55	97	47	29	66
4·0— 8·5	31	22	10	93	73	64	131	82	55
≤ 3·5	3	3	10	34	10	38	19	12	84
Total ...	**167**	**111**	**32**	**134**	**138**	**201**	**197**	**123**	**205**
3. Selkäkari									
>19·0	1	—	—	—	—	—	—	—	—
14·5—19·0	4	13	7	1	1	1	—	1	3
9·0—14·0	68	151	24	21	106	152	64	40	80
4·0— 8·5	16	31	35	89	95	50	226	67	111
≤ 3·5	—	4	18	45	16	45	44	28	143
Total ...	**89**	**199**	**84**	**156**	**218**	**248**	**334**	**136**	**337**
4. Ulkomeri: Leipäre, Härkönen, Möyly									
>19·0	—	1	—	1	—	—	—	3	—
14·5—19·0	11	1	1	2	—	22	—	4	7
9·0—14·0	143	160	36	66	149	180	120	103	91
4·0— 8·5	69	33	36	147	195	55	134	202	87
≤ 3·5	1	3	1	13	—	25	37	43	77
Total ...	**224**	**198**	**74**	**229**	**344**	**282**	**291**	**355**	**262**

Kuivaniemi Region: 1. Ryöskerinkalla, Liipas (Aaponmatala, Kuivanmatala, Samuli, Ulkomatala, Rintamatala, Käpsä, Kallanletto, Kukko)

>19·0	1	1	—	—	—	—	—	1	—
14·5—19·0	21	18	3	2	10	12	4	8	20
9·0—14·0	552	286	69	45	356	426	192	205	248
4·0— 8·5	173	43	95	191	320	139	658	660	593
≤ 3·5	22	19	70	90	53	75	188	189	527
Total ...	**769**	**367**	**237**	**328**	**739**	**652**	**1042**	**1063**	**1388**

2. Häskeri, Lahdenmatala, Lahdenranta, Käpsänkallio, Hijanjuoni, Rahtunen)

>19·0	2	1	—	—	—	1		—	—
14·5—19·0	3	4	2	—	—	2	—	7	—
9·0—14·0	56	46	10	2	22	37	42	31	48
4·0— 8·5	33	25	26	6	34	37	185	115	48
≤ 3·5	6	11	10	18	21	20	11	20	53
Total ...	**100**	**87**	**48**	**26**	**77**	**97**	**238**	**173**	**149**

3. Halttula, Oriniemi, Kaakkuri, Onsaja, Kokonsalmi, Koivuluoto (Hietakalla)

>19·0	3	4	—	—	—	1	1	—	1
14·5—19·0	30	39	3	—	11	8	17	8	4
9·0—14·0	257	265	32	27	217	471	196	91	180
4·0— 8·5	153	99	49	122	217	154	1026	533	420
≤ 3·5	34	42	21	84	98	62	134	176	304
Total ...	**477**	**449**	**105**	**233**	**543**	**696**	**1374**	**808**	**909**

Weight-Classes	1936	1937	1938	1939	1940	1941	1942	1943	1944
4. Hepoharju, Krassi, Raumanperä, Nikanjuoni									
>19·0	1	—	2	—	—	—	—	—	—
14·5—19·0	—	9	2	2	3	1	2	1	6
4·0—14·0	81	118	13	5	93	48	45	22	22
1·0— 8·5	40	27	11	10	95	63	170	143	84
≦ 3·5	8	4	7	11	8	24	4	23	90
Total ...	**130**	**158**	**35**	**28**	**199**	**136**	**221**	**189**	**202**
Ii Region: River: Venäjänkari, Haukka and Illi Weirs									
>19·0	—	—	—	—	—	—	—	—	—
14·5—19·0	—	—	—	5	—	7	—	—	—
9·0—14·0	—	—	—	151	224	388	—	—	—
4·0— 8·5	—	—	—	77	139	70	—	—	—
≦ 3·5	—	—	—	77	8	18	—	—	—
Total ...	—	—	—	**310**	**371**	**483**	—	—	—
Sea: 1. Petäjäluoto, Mustakivi, Majava									
>19·0	—	—	—	—	—	9	—	—	—
14·5—19·0	7	1	7	—	—	22	11	—	—
9·0—14·0	95	111	21	—	15	29	43	6	4
4·0— 8·5	28	2	29	—	16	62	142	63	3
≦ 3·5	37	18	18	—	26	49	50	34	23
Total ...	**167**	**132**	**75**	—	**57**	**171**	**246**	**103**	**30**[1])
2. Pöydanpää, Papinkari, Antinmatala, Maa- and Ulkokaapri (Lounasletto, Keskiletto, Lännensija, Syvänjuoni)									
>19·0	1	2	1	—	—	1	—	1	6
14·5—19·0	15	13	4	—	6	10	9	—	9
9·0—14·0	123	160	49	—	70	143	91	30	56
4·0— 8·5	96	59	51	—	129	79	185	223	219
≦ 3·5	2	3	71	—	108	63	75	71	112
Total ...	**237**	**237**	**176**	—	**313**	**296**	**360**	**325**	**402**
3. Laitakari									
>19·0	1	1	1	—	—	—	1	1	—
14·5—19·0	10	19	13	1	9	6	8	7	2
9·0—14·0	114	237	114	59	124	152	159	87	8
4·0— 8·5	140	73	79	41	148	83	367	272	17
≦ 3·5	—	39	61	27	1	6	60	62	12
Total ...	**265**	**369**	**268**	**128**	**282**	**247**	**595**	**429**	**39**[2])
4. Kutinkalla, Röyttä, Peura, Maa- and Ulkoklaama, Pihlajakari									
>19·0	3	1	—	1	—	—	—	—	—
14·5—19·0	21	18	—	4	4	6	14	—	5
9·0—14·0	276	279	39	100	218	199	112	152	170
4·0— 8·5	51	55	20	38	111	87	336	260	387
≦ 3·5	3	14	—	7	19	12	76	111	139
Total ...	**354**	**367**	**59**	**150**	**352**	**304**	**538**	**523**	**701**

[1]) Only from Mustakivi.
[2]) From Latoranta, Kutuletto and Tykkikari grounds.

Weight-Classes	1936	1937	1938	1939	1940	1941	1942	1943	1944
5. Pitkäkari, Nokkaletto, Praava, Pohjoisnokka									
>19·0	1	—	1	—	1	2	—	—	—
14·5—19·0	9	9	5	1	2	2	1	3	3
9·0—14·0	107	50	29	45	95	107	130	57	61
4·0— 8·5	28	25	18	18	42	22	274	105	82
≦ 3·5	3	10	4	3	7	5	10	31	43
Total ...	**148**	**94**	**57**	**67**	**147**	**138**	**415**	**196**	**189**

3. The Temperature during the Incubation Period of

	The Mean Temperature during the Month							The Monthly Tot	
	X	XI	XII	I	II	III	IV	X	XI
1914/1915	+1·9	—2·2	—3·4	—11·4	—9·3	—10·5	+0·6	—	66
1915/1916	+1·0	—7·3	—17·8	—7·6	—7·0	—6·5	+1·2	—	219
1916/1917	—1·0	+0·4	—6·8	—12·7	—14·7	—11·5	—1·2	—	—
1917/1918	+5·2	—2·5	—6·9	—14·7	—8·4	—4·4	+1·8	—	75
1918/1919	+5·0	+1·2	—6·2	—6·9	—14·2	—7·4	—0·7	—	—
1919/1920	+2·0	—6·0	—10·1	—10·8	—5·8	—0·1	+2·2	—	180
1920/1921	+1·4	+0·6	—3·8	—11·4	—9·8	—1·7	+4·2	—	—
1921/1922	+0·7	—7·6	—7·0	—10·2	—10·0	—7·5	—0·3	46	229
1922/1923	+0·9	—3·8	—9·2	—5·6	—12·8	—5·3	—2·8	57	123
1923/1924	+3·3	—2·5	—7·6	—8·8	—11·5	—6·6	—1·1	7	106
1924/1925	+5·8	—1·6	—3·4	—1·5	—4·8	—8·1	+1·7	—	67
1925/1926	+0·5	—7·2	—10·4	—13·6	—11·0	—5·0	—0·9	40	217
1926/1927	—0·4	—1·3	—9·4	—11·1	—8·9	—5·1	—0·1	73	82
1927/1928	—0·3	—8·0	—9·8	—8·9	—9·5	—5·2	+0·2	74	244
1928/1929	+0·7	—3·3	—6·0	—10·0	—14·7	—5·3	—4·2	37	109
1929/1930	+3·5	+1·0	+0·4	—2·2	—7·3	—5·6	+1·1	15	23
1930/1931	+2·6	—3·1	—7·3	—11·8	—9·1	—8·8	+0·7	17	127
1931/1932	+2·7	—0·5	—6·5	—3·8	—9·3	—6·2	+1·5	23	50
1932/1933	+1·2	—1·0	—0·1	—7·0	—11·4	—8·1	—1·0	21	55
1933/1934	+3·3	—4·4	—7·5	—2·7	—8·0	—4·6	—1·1	4	146
1934/1935	+4·0	—0·9	—3·6	—7·5	—8·8	—6·4	+0·4	2	51
1935/1936	+3·7	+0·5	—2·4	—9·4	—16·3	—7·8	+0·5	16	40
1936/1937	+0·5	+0·7	—0·6	—6·5	—10·9	—6·0	+4·3	26	24
1937/1938	+4·9	—0·6	—7·9	—6·9	—3·8	—3·4	—0·4	—	57
1938/1939	+5·4	+2·1	—4·4	—8·6	—4·7	—3·8	—0·6	—	14
1939/1940	+1·1	+0·7	—7·0	—14·3	—14·1	—12·3	—1·5	13	23
1940/1941	+3·8	—2·7	—8·4	—13·8	—11·1	—8·4	—2·3	14	99
1941/1942	—1·0	—4·4	—15·6	—17·2	—12·6	—12·8	—0·6	102	146
1942/1943	+3·3	—3·6	—6·5	—11·3	—3·7	—2·9	+0·5	7	113
1943/1944	+4·0	+0·3	—2·5	—6·4	—6·3	—5·4	—2·5	7	20

zed Eggs of Salmon in northern Finland (Oulu).

below Zero				The Successive Total of Degrees below Zero						Year-Class as Life-Cycle 3·3 (+)
II	III	IV	X	XI	XII	I	II	III	IV	
261	325	-		66	171	524	785	**1110**		1921
203	201			219	771	1006	1209	**1410**		1922
411	356	36		-	211	605	1016	1372	1408	1923
235	136	-		75	286	742	977	**1113**		1924
398	222	21			192	406	804	**1026**	1041	1925
163	3			180	493	828	**991**	994		1926
275	53			-	118	471	746	**799**		1927
281	238	43	46	275	497	813	1094	**1332**	1375	1928
358	166	86	57	180	468	638	996	1162	**1248**	1929
322	205	58	7	113	356	631	953	**1158**	1216	1930
120	**253**	9	-	67	206	270	390	**643**	652	1931
312	155	75	40	257	579	1001	1313	**1468**	**1543**	1932
251	160	21	73	155	448	794	1045	**1205**	1226	1933
266	164	42	74	318	622	898	1164	**1328**	1370	1934
412	178	130	37	146	335	650	1062	1240	**1370**	1935
210	184	14	15	38	66	163	373	557	**571**	1936
258	275	47	17	144	381	747	1005	**1280**	1327	1937
267	196	9	23	73	275	406	673	**869**	878	1938
219	258	65	21	76	104	328	547	**805**	870	1939
228	154	74	4	150	386	474	702	856	**930**	1940
250	200	29	2	53	172	406	656	**856**	885	1941
456	244	57	16	56	138	429	885	**1129**	1186	1942
305	189	6	26	50	95	301	606	**795**	801	1943
109	117	47	—	57	305	519	628	**745**	792	1944
138	123	56	- -	14	185	453	591	**714**	770	(1945)
389	**381**	65	13	36	259	693	1082	**1463**	**1528**	(1946)
311	260	90	14	113	376	809	1120	**1380**	1470	(1947)
345	**399**	72	102	248	732	**1265**	**1610**	**2009**	**2081**	(1948)
109	103	23	7	120	330	681	790	**893**	916	(1949)
177	167	90	7	27	111	296	473	640	**730**	(1950)

Appendices.

I. Water-Level in the Tornio, Kemi and Oulu Rivers during the Years 1921–1937.

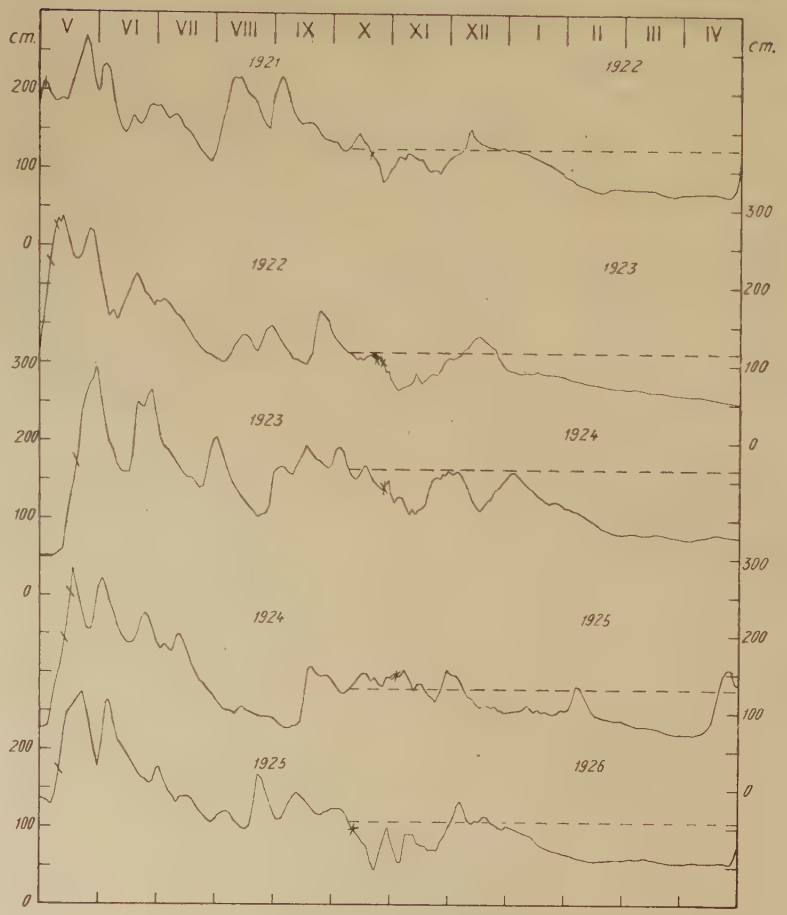

Figure 1. 1921—1926.

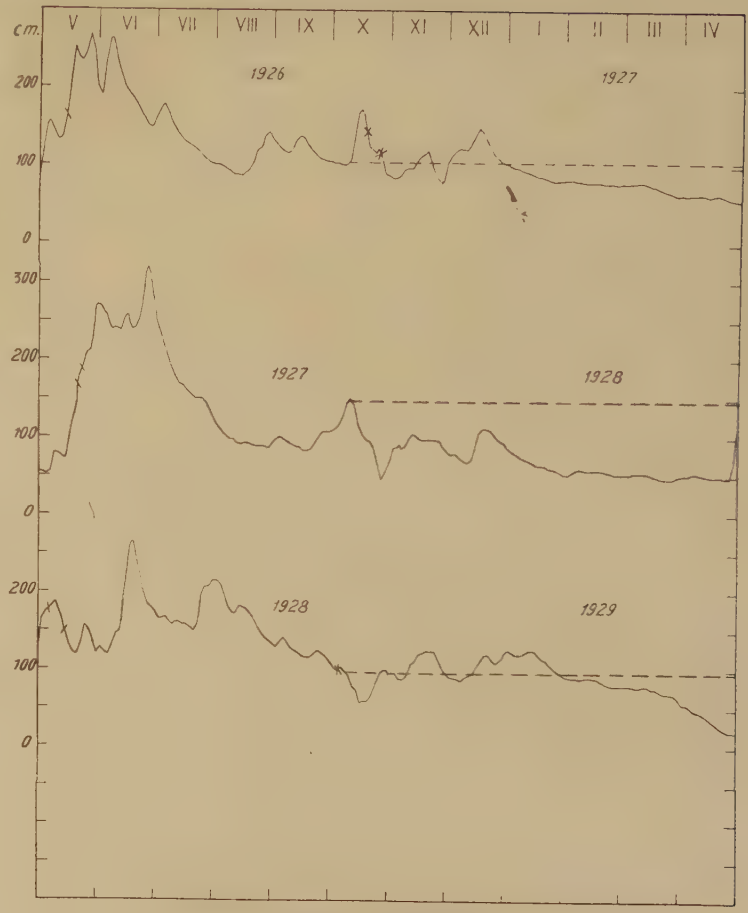

Figure 2. 1926—1929.

Water Level in the Tornio River above Kukkola Rapids.

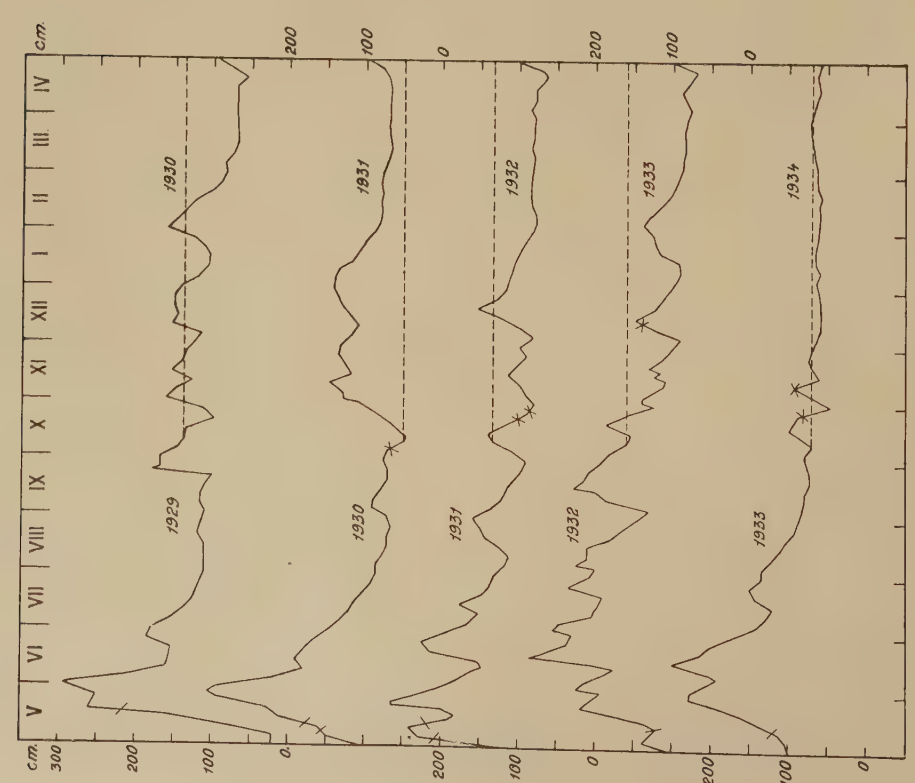

Figure 3. 1929–1934.

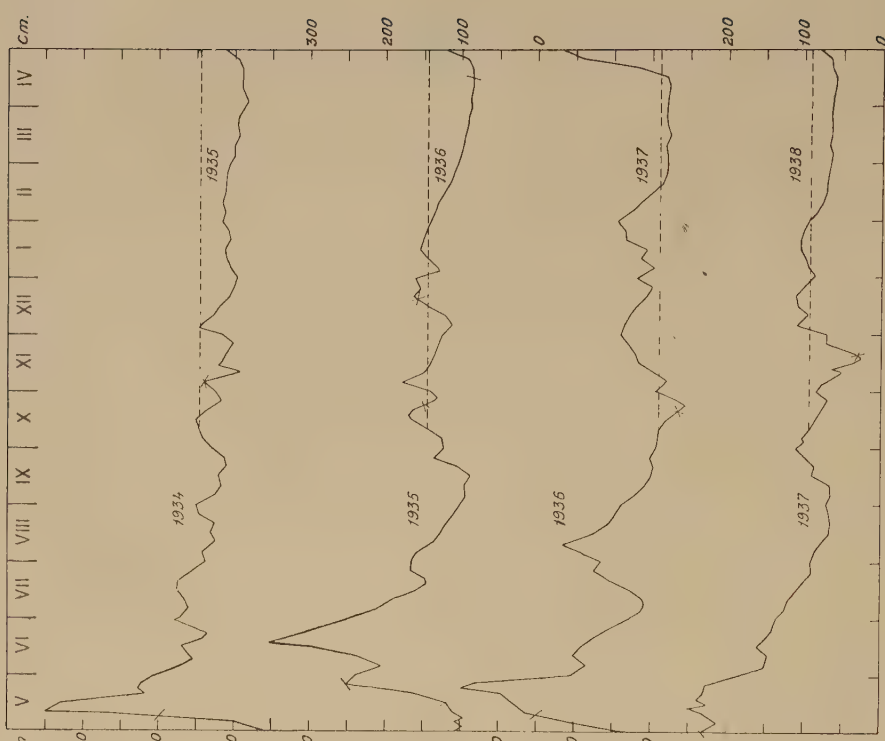

Figure 4. 1934–1938.

Water Level in the Tornio River above Kukkola Rapids.

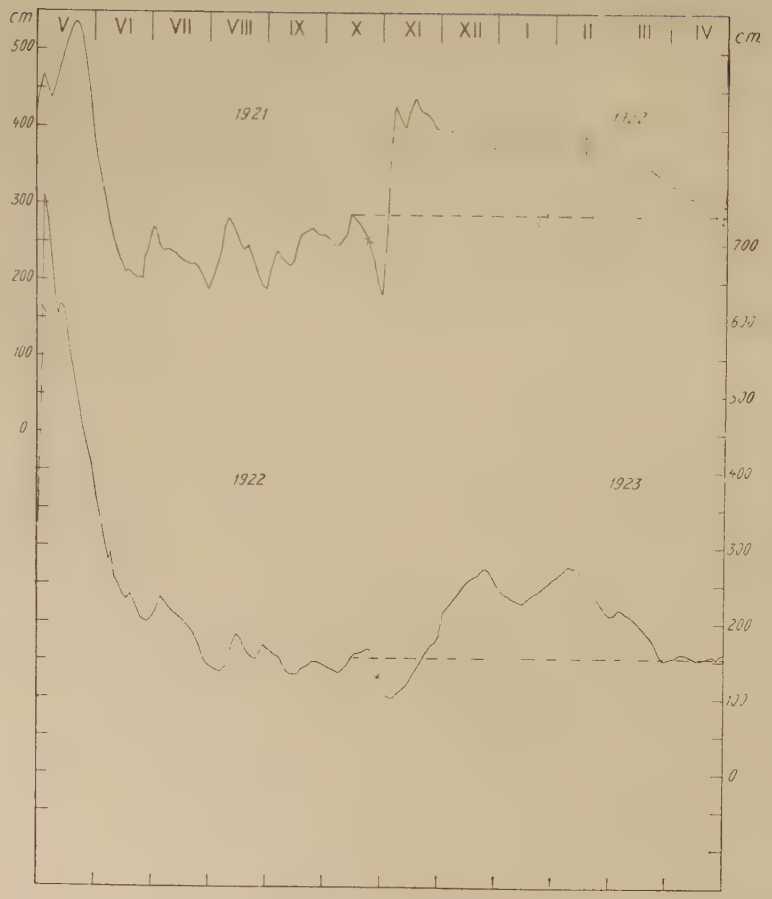

Figure 5. 1921—1923.

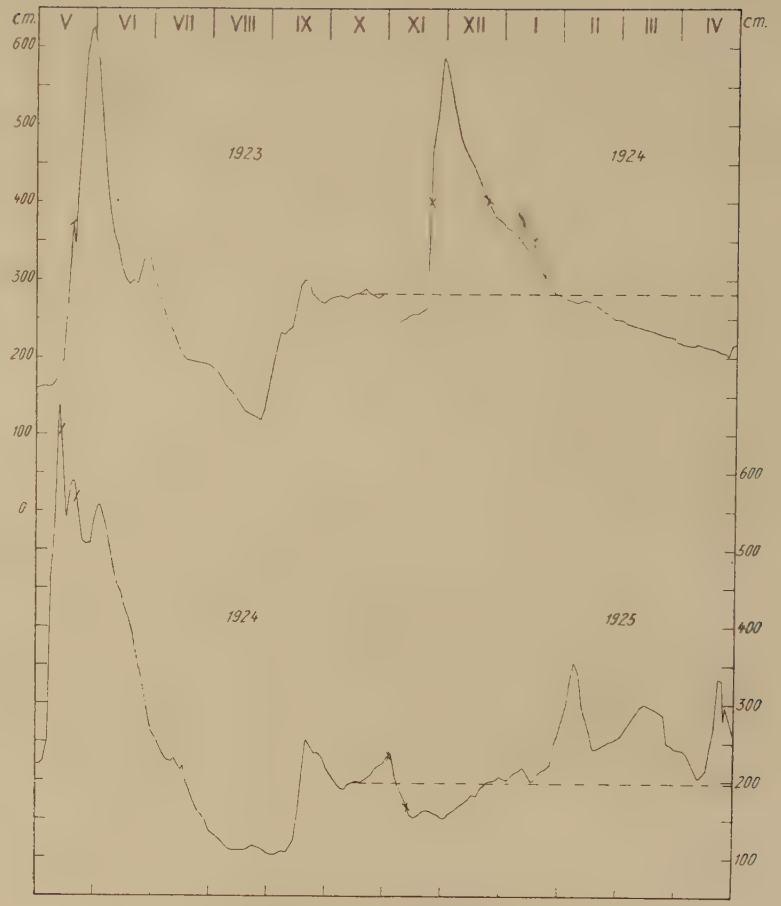

Figure 6. 1923—1925.

Water Level in the Kemi River below the Taivalkoski Rapids.

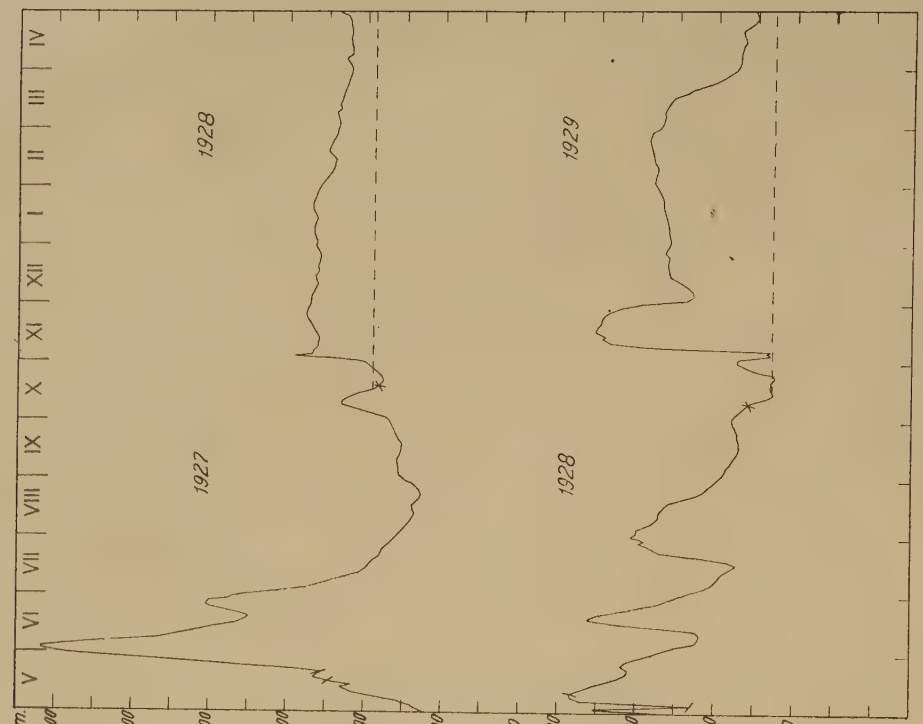

Figure 8. 1927–1929.

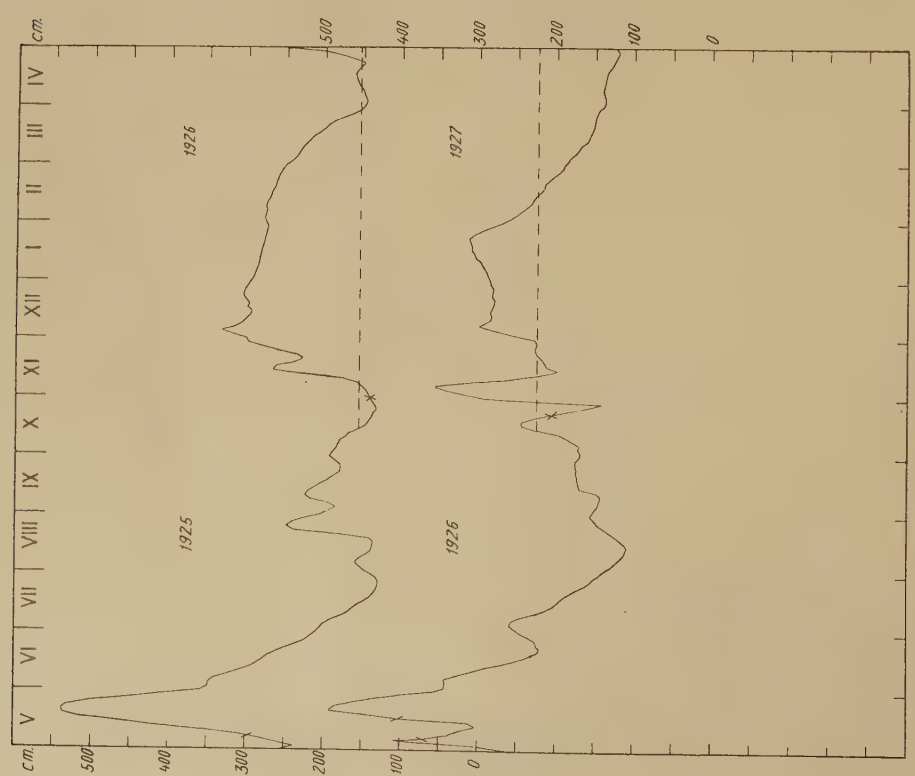

Figure 7. 1925–1927.

Water Level in the Kemi River below the Taivalkoski Rapids.

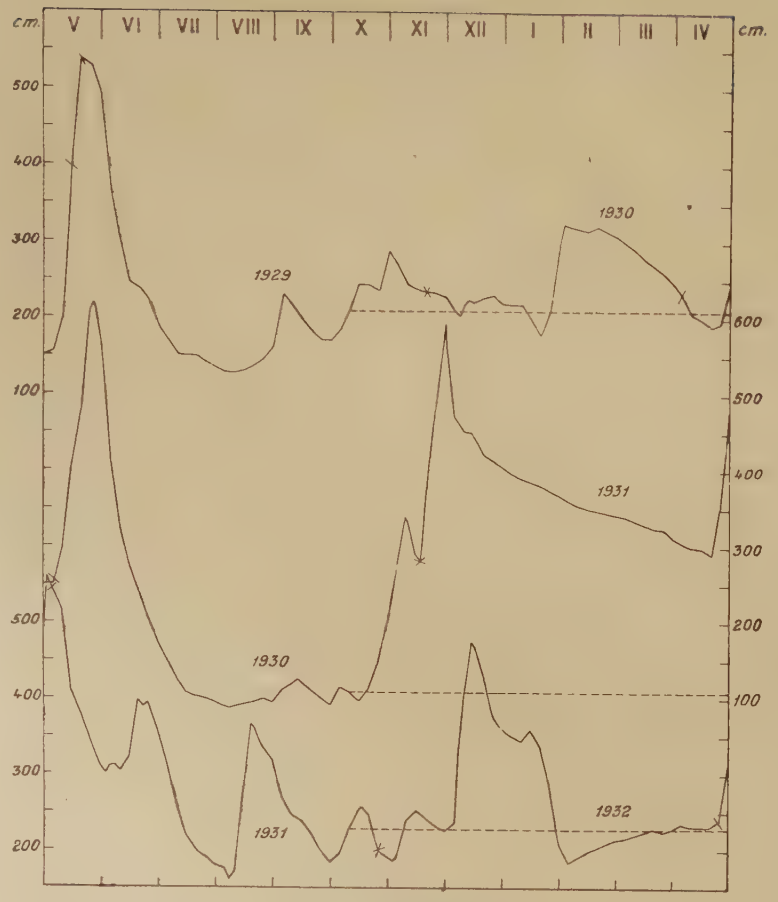

Figure 9. 1929–1932.

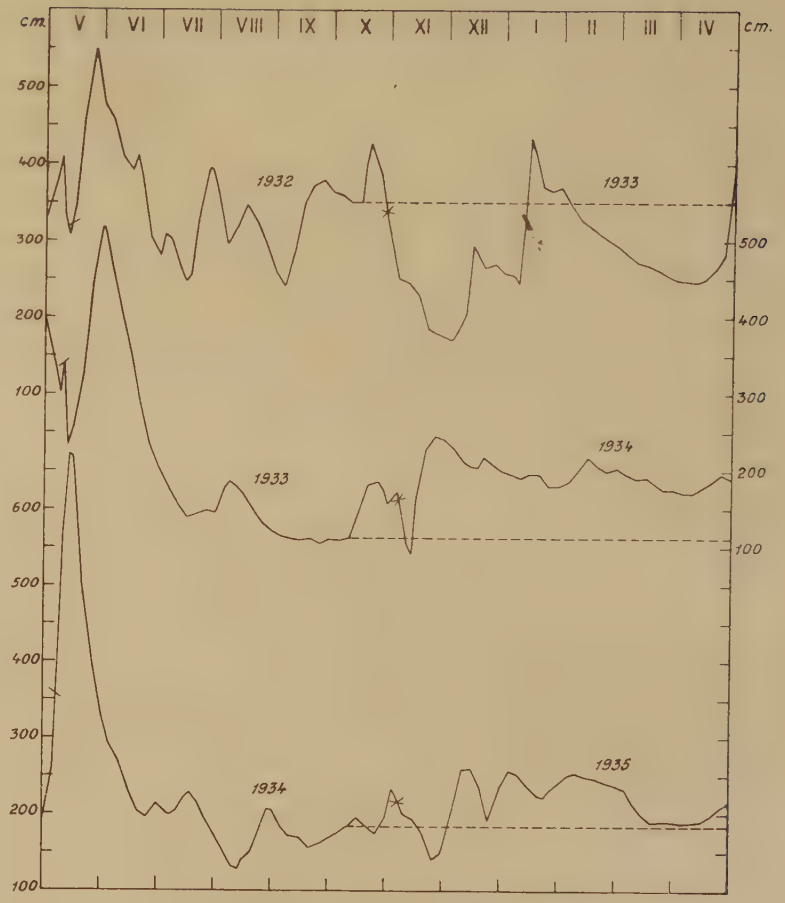

Figure 10. 1932–1935.

Water Level in the Kemi River below the Taivalkoski Rapids.

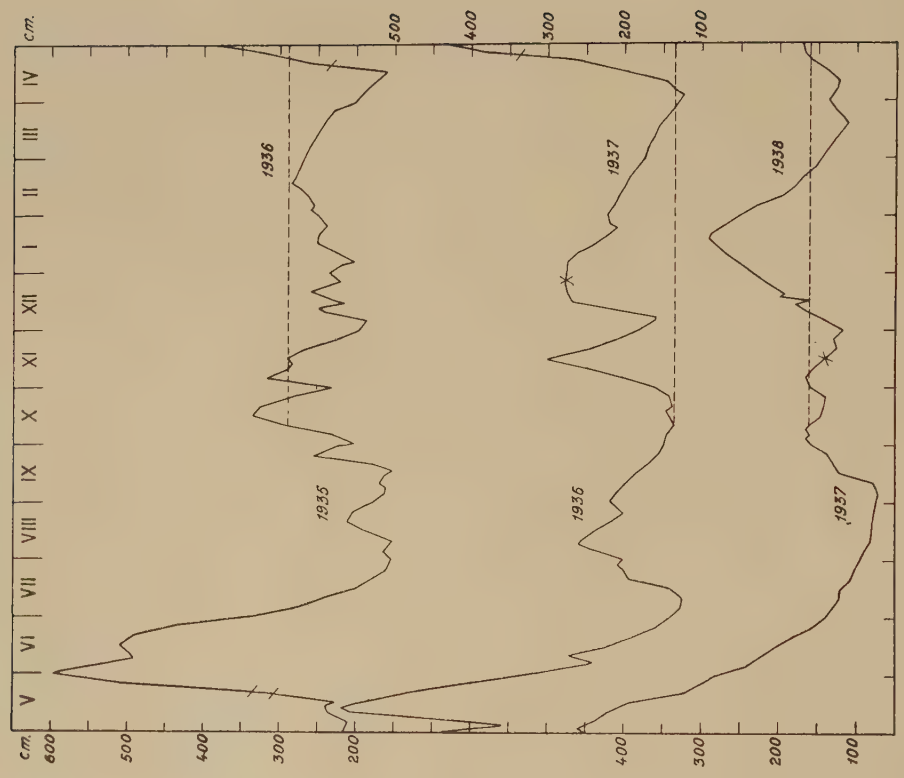

Figure 11. 1935–1938.

Water Level in the Kemi River above the Taivalkoski Rapids.

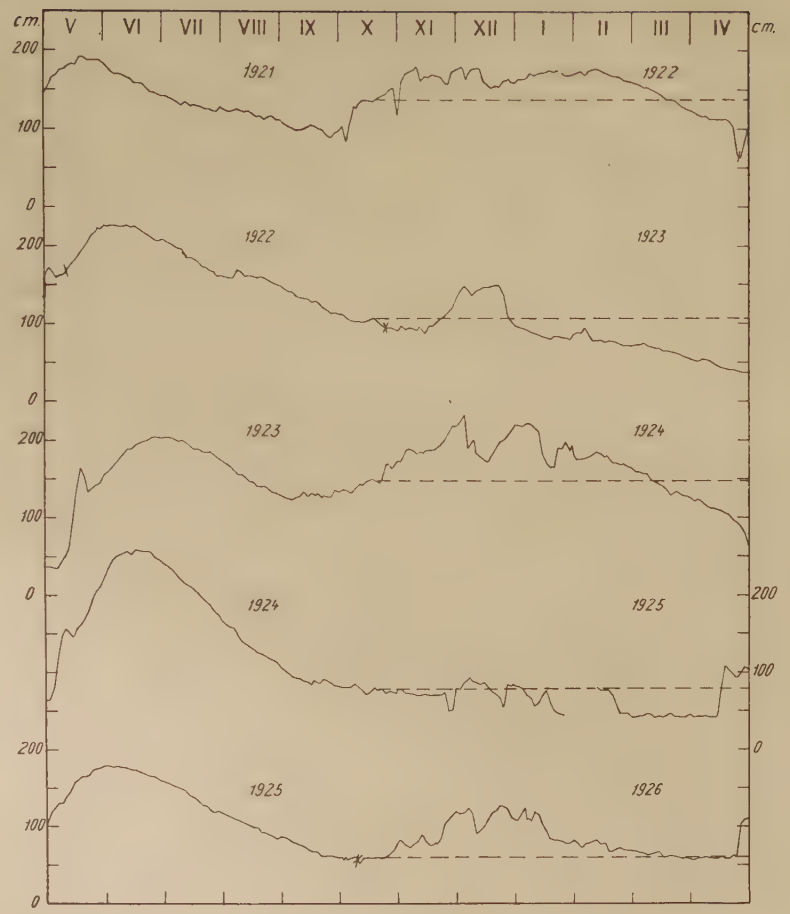

Figure 12. 1921—1926.

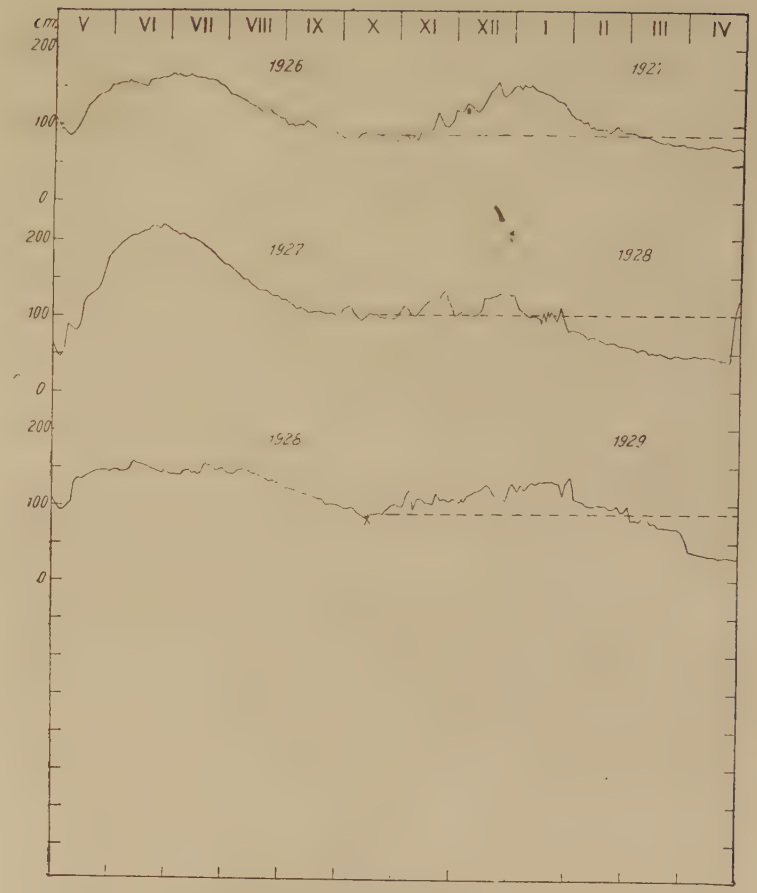

Figure 13. 1926—1929.

Water Level in the Oulu River; Sotkajärvi.

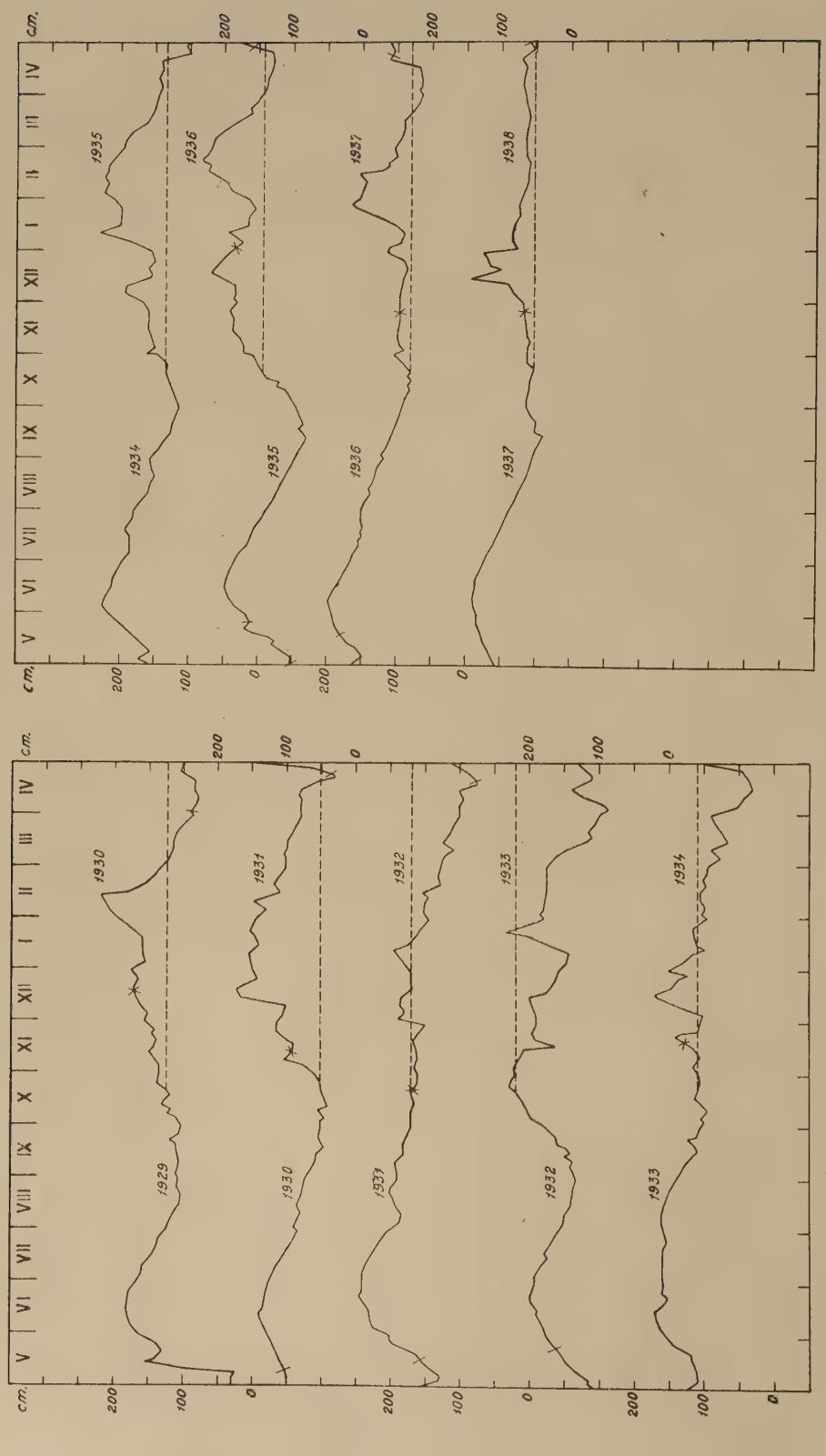

Figure 14. 1929–1934.

Figure 15. 1934–1938.

Water Level in the Oulu River: Sotkajärvi.

Fig. 1. Two-year-old parr (2.+): 14.2 cm., 28.4 g. ×80; Sept. 1929, Kaihua ponds (Rovaniemi at Kemi River).

Fig. 2. Smolt (2.+): 13.1 cm., 21.0 g., ♂, ×87; in the Beginning of June 1915, Bothnian Sea, Viasvesi (c. 20 km. from Mäntysaari harbour in the estuary of Kokemäki River).

Fig. 3. Grilse (3.1+): 55 cm., 1.8 kg., ×34; at the End of Sept. 1937, estuary of Tornio River.

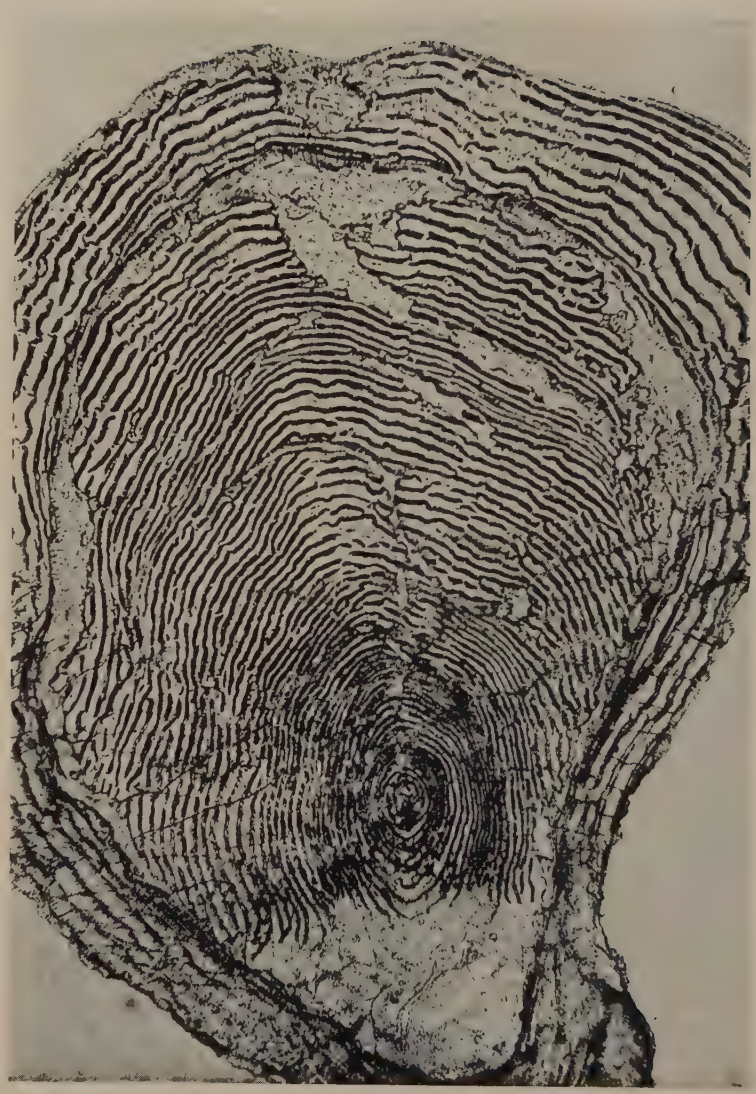

Fig. 4. Small salmon (2.1+G+): spawned as grilse, short absence (returned to the fresh water in the same year as it went down as a kelt), 60 cm., 4.5 kg., ×31; 23. Aug. 1938, Oulu River, Pyhäkoski.

Fig. 5. Large salmon (4.2+G+): spawned as small salmon, short absence (returned to the fresh water in the same year as it went down as a kelt), 90 cm., 7.8 kg., ♀, ×24; 12. Aug. 1933, Kem, Valkeakari.

Fig. 6. Large salmon (3.2+G1): spawned as small salmon, long absence (returned to the fresh water in the year following that in which it went down as a kelt), 105 cm., 14.0 kg., ♀, × 22; 16. June 1933, Kemi, Valkeakari.

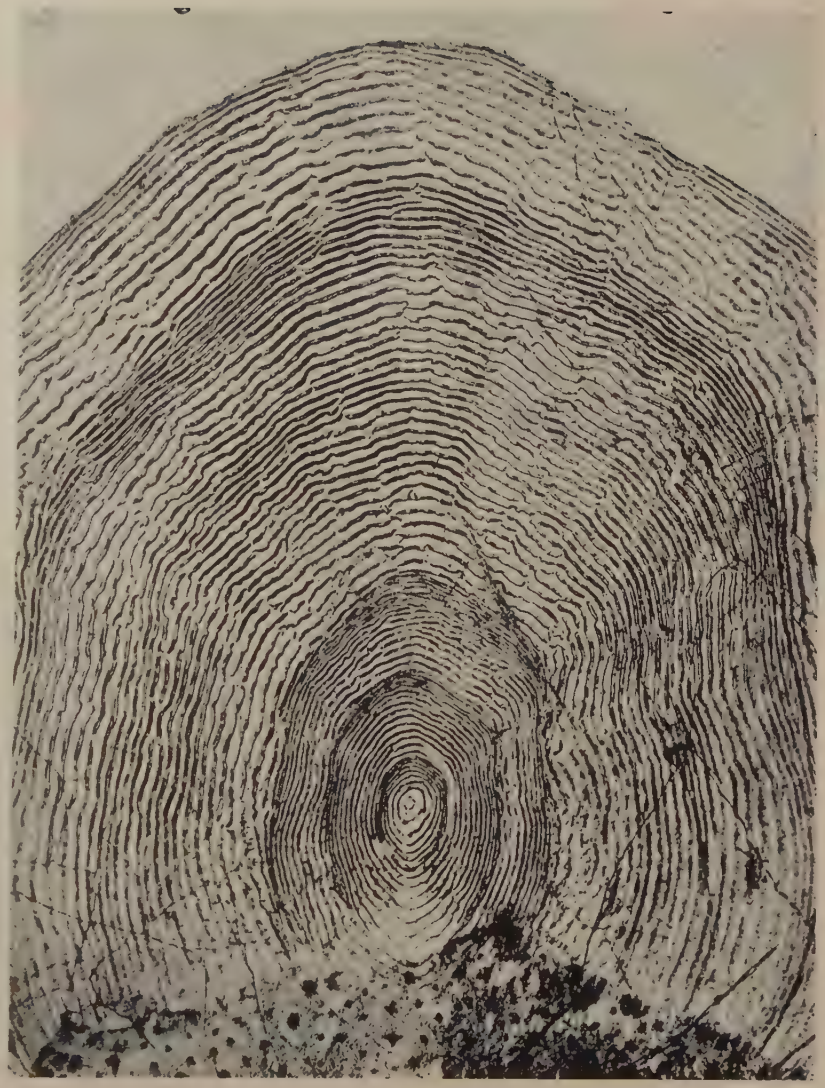

Fig. 7. Grilse (3.1+): 52 cm., 2.5 kg., ♂. ×27; 21. July 1926. Kemi River.

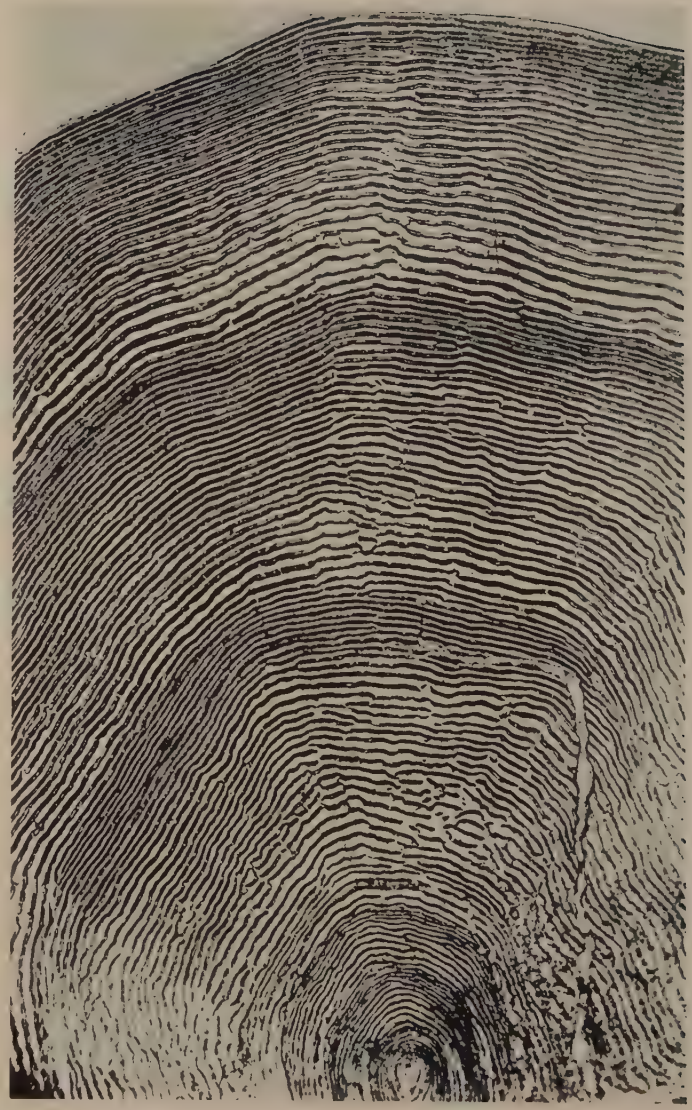

Fig. 8. Large salmon (3.3): 95 cm., 11.5 kg., ♀, ×26; 8. July 1927. Oulu River.

Fig. 9. Large salmon (5.3): 102 cm., 11.0 kg., ♀, ×22; 9. June 1932, Kemi, Valkeakari.

Fig. 10. Very large salmon (3.4): 110 cm., 17.0 kg., ♀, ×22; 2. July 1925, Oulu River, Pyhäkoski.

Fig. 11. Very large salmon, twice spawned (3.2+G1G1): 110 cm., 12.0 kg., ♀, ×23; 12. June 1925, Kemi River, Korva Weir pen.

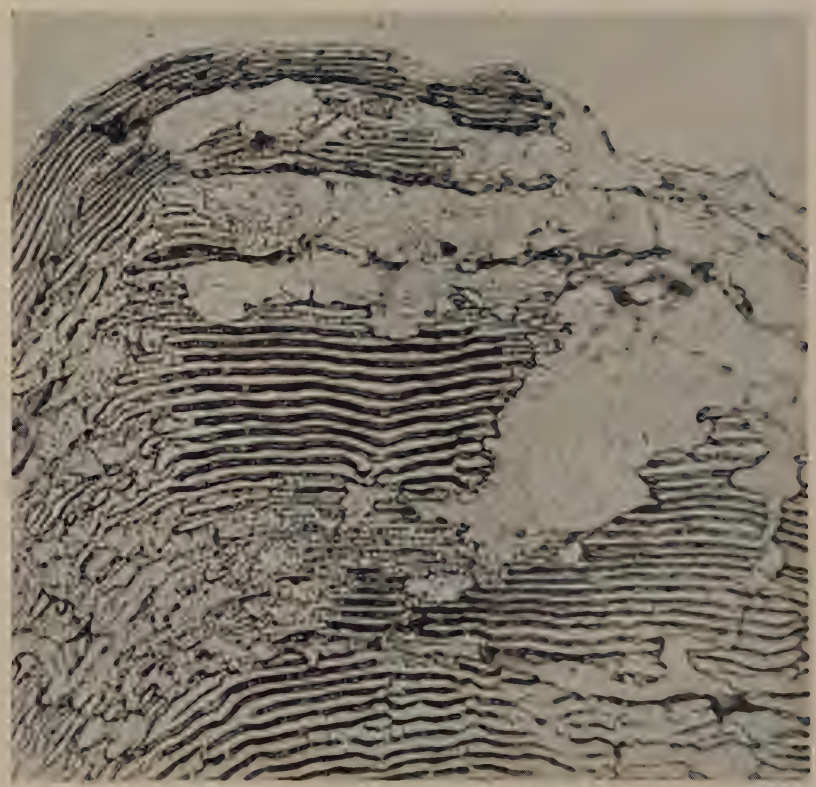

Fig. 12. Very large salmon, three times spawned (2.3G1G1G1): 113 cm., 15.0 kg., ♀, ×36; 6. Aug. 1928, Oulu River, Maijala netting ground.

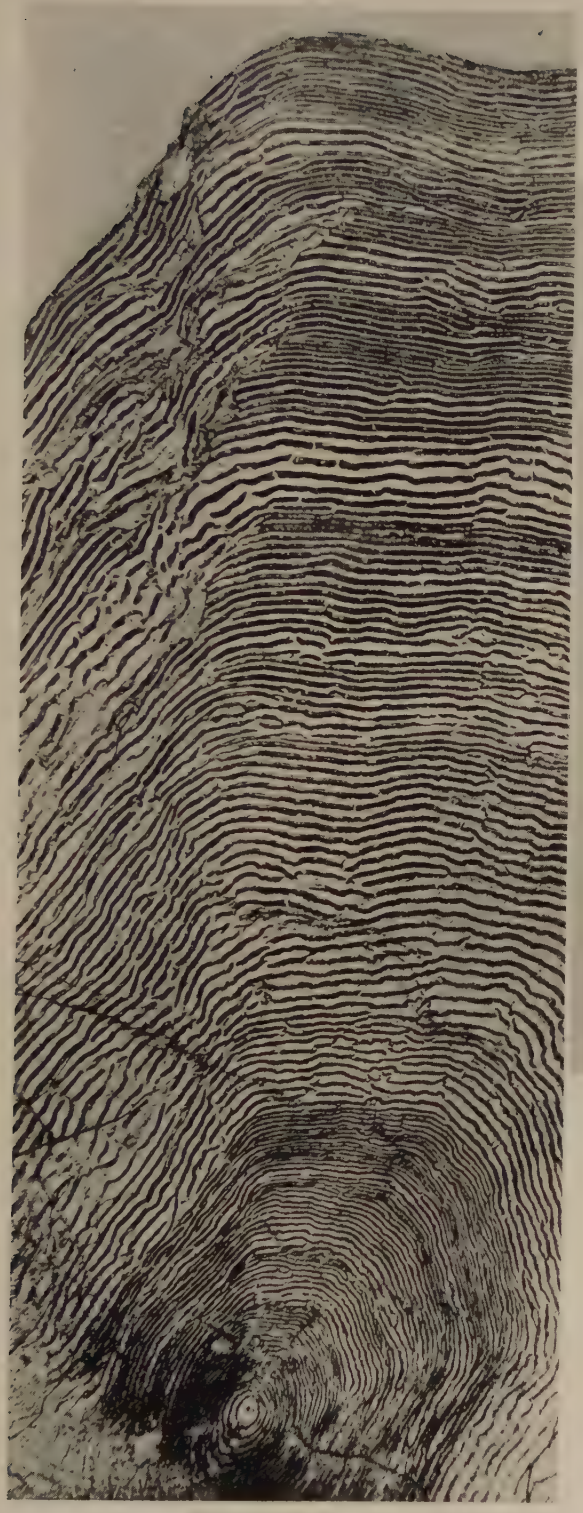

Fig. 13. Large salmon, four times (?) spawned (5.1+G+G+G+G+): 97 cm., 10.0 kg., ♂, ×84; 9. July 1938, Tornio River, Kiviranta.

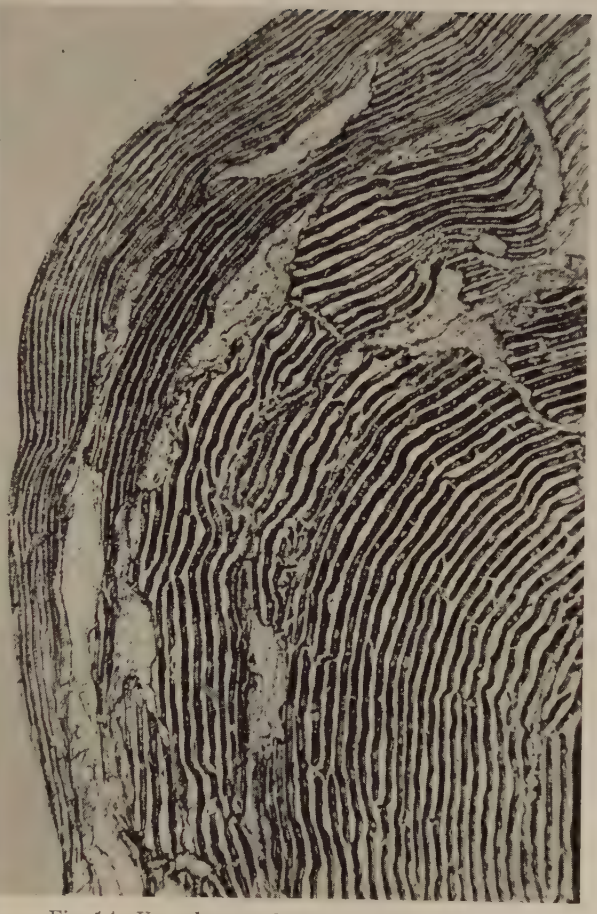

Fig. 14. Very large salmon, three times spawned (2.3G1G1G1): 110 cm., 12.0 kg., ♀, ×47; 7. July 1938, Kymi River, Langinkoski.

Fig. 15. Large salmon (3.3+), 98 cm., 10.5 kg., ♀, ×27; 8/6 June 1935. Kemi, Valkeakari.

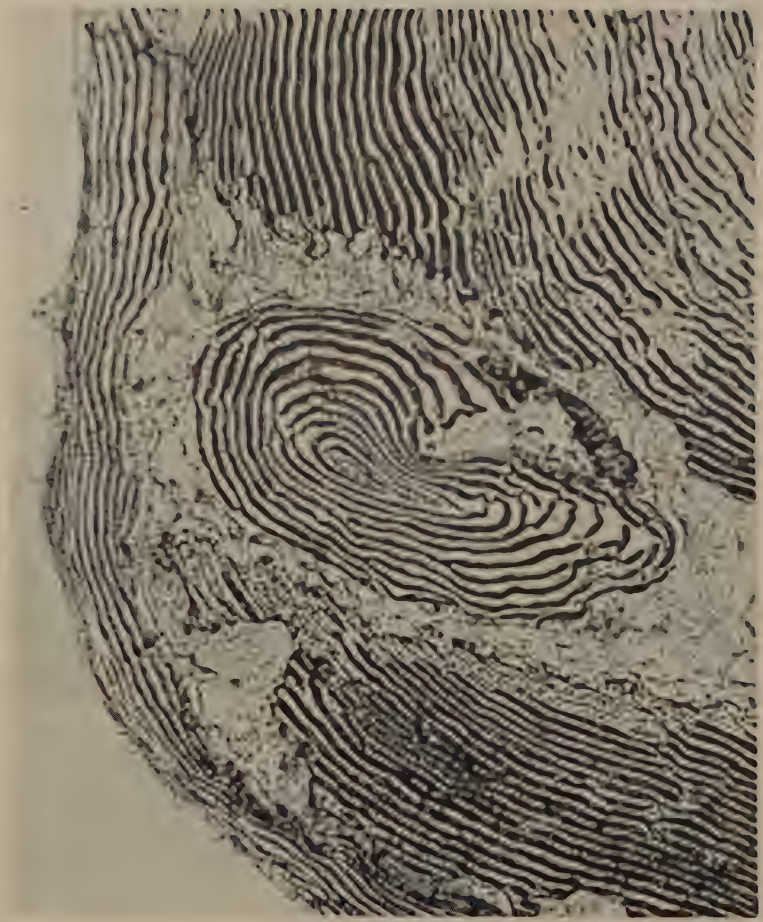

Fig. 16. New centre of growth in 2nd year at sea, ×47; summer 1935. Tornio River, Kiviranta.

Figs. 15 and 16. Exceptionally regenerated scales.

Fig. 17. Large kelt (3.3G): 108 cm., 9.0 kg., ×23; 5. June 1933, Kemi, Valkeakari.
Checks in 1st and 2nd year at sea.